NHH – Norwegian School of Economics
HEC Paris – Hautes Études Commerciales de Paris

Bergen/Paris/Dar-Es-Salaam, Winter 2013

Girl Empowerment
A Survey of Young Women in Tanzania

Laura Herzig

Thesis Advisor: Professor Kjetil Bjorvatn

Master Thesis in Economics and Business Administration
Major in Energy, Natural Resources and the Environment

I

Abstract

This study is a contribution to the Girl Empowerment Project launched by Christian Michelsen Institute (CMI) in cooperation with NHH Norwegian School of Economics, Femina HIP, the Economic and Social Research Foundation (ESRF), and the Development Pioneer Consultants (DPC). Teenage pregnancies have emerged as one of the main challenges to current public and educational policies in Tanzania. Recent statistics show a clear and increasing link between early pregnancies and school drop-outs, as well as higher maternal and infant mortality. Existing literature suggests that postponing the initial age of childbirth amongst young women in Tanzania positively impacts their professional and personal development. Starting a family at a later state in life substantially increases their chances of finishing secondary school and becoming economically active throughout their lifetime. Given those positive social and economic side effects of postponing motherhood, the big challenge faced by policy makers is to find the right motivational tool to address the target group. As a contribution to those efforts, the Girl Empowerment Project suggests two different interventions, a health information campaign and economic empowerment training. The project is designed as a randomized field experiment, where schools are offered (1) a health program, (2) an economic empowerment program, (3) both programs, or (4) no program (control group). Baseline data was collected during April 2013, while the programs were implemented from July to early September 2013. The first round of follow-up studies took place from late September to October 2013. The current thesis makes use of the baseline data and analyses the level of health and entrepreneurship knowledge among the girls in the sample. Furthermore, it studies how these types of knowledge correlate with a more empowered attitude and behavior documented in the baseline survey. Investigating the link between health and business knowledge and the girls' fertility and economic aspirations, the study at hand provides some useful insights into whether or not we can expect either one of the interventions to be successful. However, while the overarching Girl Empowerment Project investigates the causal impact of the different training programs on outcomes, the current thesis relies on correlations and the evidence is thus suggestive. Nevertheless, the findings imply that a higher level of business knowledge is indeed associated with a more empowered behavior among survey participants, reducing their vulnerability to early pregnancy. Health knowledge on the other hand depicts the same tendency as business knowledge but proves to be of less statistical significance.

II

Acknowledgements

This master thesis finalizes my double degree master program in *Sustainable Development* at HEC Paris and *Economics and Business Administration* with a major in *Energy, Natural Resources and the Environment* at NHH Norwegian School of Economics. The combination of both master programs allowed me to broaden my understanding of two of the most challenging and pressing issues of current economic developments.

I would like to express my gratitude to Professor Kjetil Bjorvatn for his enthusiastic support and guidance through the learning process of this master thesis and for offering me the great opportunity to take part in the research project in Tanzania. I highly appreciated his helpful thoughts and ability to create an enjoyable working environment at all times. I would also like to thank Mr. Ole Johan Berge for his support as an international student advisor.

Evidently, this study would not have been possible without the commitment and hard work of the entire research team contributing to the Girl Empowerment Project and the cooperation of the survey participants. For their valuable input and contribution to this study, I particularly want to thank Bertil Tungodden, Lars Ivar Oppedal Berge, Vincent Somville, Juda Lyamai, Linda Helgesson, Amina Mohamed, Jonas Tungodden and Ranveig Falch. Working with you has been a great pleasure.

Finally, I would like to thank my amazing family who has patiently supported me throughout the entire duration of my studies. Furthermore, I am thankful for all the great people I met over the past years who made my student life an unforgettable and enriching experience. In particular, I want to thank Katja Friedrichs, Kam Phung, Albane Mazoyer, Hanne Solem, Nguyen Tran, Sulamith Schaeff and Yannic Franken.

Thank you, Tusen Takk, Vielen Dank, Merci beaucoup, Dank U wel, Asante Sana,

Laura Herzig
Oslo, Norway

---

20. December 2013

Table of Content

VI

List of Figures

List of Tables

Abbreviations

CMI	Christian Michelsen Institute
CSEE	Certificate of Secondary Education Examinations
DPC	Development Pioneer Consultants LTD
ESRF	Economic and Social Research Foundation
ILO	International Labour Organization
NHH	Norwegian School of Economics
UN	United Nations
UNICEF	United Nations Children's Fund
RCTs	Randomized Controlled Trials
SD	Standard Deviation
STEP	Skills Training and Employment Programme
WHO	World Health Organization

1 Introduction

1.1 Context

According to a report published by the World Health Organization (WHO) in 2012, approximately 16 million girls between the age of 15 and 19 give birth every year. Another two million need to be added to that number if the childbirths of girls below the age of 15 are taken into account (World Health Organization, 2012a). While so called teen pregnancies also pose a problem to industrialized countries, they are comparatively more problematic in developing countries which are often characterized by higher poverty rates, relatively poor health and social welfare systems, as well as overall worse health conditions. Thus, the prevailing environment in developing countries renders early pregnancy more dangerous for young girls as they are less likely to be physically or economically able to cope with the challenges of giving birth at a young age. Unsafe abortions, stillbirths as well as low birth weights are consequentially more prevalent among teenage mothers than among women above the age of 20. Furthermore, as young mothers bear higher risks during pregnancy and delivery, the death rates associated with teen pregnancies are substantially higher than those measured amongst older women (World Health Organization, 2012a). On a different note, according to the findings obtained in a survey on adolescent girls in Tanzania by the International Labor Organization (2012), teen pregnancies increase the risk of obtaining HIV/AIDS as unwanted pregnancies increase the probability of girls getting involved in commercial sexual activities in order to generate some sort of income. This trend is particularly strong for girls from poor economic backgrounds whose families do not have the financial means to support them (International Labour Organization, 2012).

From a socio-economic perspective, the negative side effects of teen pregnancies constitute a major threat to the healthy development of a society. Early pregnancies tend to lead to school dropouts and hence limit the girls' abilities to fulfill their economic potential and their contribution to society over their lifetime. On a larger scale, this impacts the overall productivity of a country's workforce as once dropped out, the girls are unlikely to ever finish secondary school or to pursue any other form of further education for that matter. Through this effect on education, adolescent pregnancies are often a cause of long-term unemployment and financial difficulties.

Depending on the social setting, teenage mothers often face some sort of social punishment or social exclusion as a result of their pregnancy. Especially in small rural areas, early pregnancies can be perceived as a burden to the community as the girls themselves are unable to provide for the additional mouth to feed. To escape the social pressure, many girls see no other option than to get involved with older men that have sufficient financial means to provide for them and their child. This hypothesis is supported by a report on early pregnancies published by the WHO in 2012. The WHO estimates the percentage of girls in developing countries getting married before the age of 18 to lie above 30 percent. In the same report, unwanted and early pregnancies are identified as the most frequently reasons to initiate marriages with older men. Furthermore, the findings suggest that early marriages often lead the girls into a vicious circle of under-education and poverty as they are unlikely to continue school after getting married (World Health Organization, 2012b). By consequence, the girls are often highly dependent on their husbands, making them vulnerable to all sorts of physical and psychological violence, which in turn harms their further physical and personal development. Also, as the girls in question enter motherhood and marriage at such an early state in their lives, teenage mothers are more prone to have above average fertility rates over their lifetime, further reducing the financial and physical resources available per child (World Health Organization, 2012b).

To sum it up, teen pregnancies are associated with comparatively higher rates of maternal and child mortality, school drop outs and HIV/AIDS infections as well as a higher risk of becoming trapped in poverty and poor health conditions. In light of these wide reaching socio-economic implications, the situation of adolescent girls in developing countries has recently regained a lot of attention and became a crucial component of international efforts to reach the fifth Millennium Development Goal of improving maternal health (United Nations, 2013).

1.2   The Girl Empowerment Project

Given the global relevance of the topic in the broader context of development economics presented above, the current trends of teen pregnancies in Tanzania are worrisome. The country is characterized by one of the highest teen pregnancy rates in the world with a median age of women at first birth of 19.5 years. Despite increasing government efforts to address this issue, the median age of women at initial childbirth has remained comparatively low over the past five years, leading to a high number of registered school drop-outs due to pregnancy

(Government of Tanzania, 2012). One reason for the government's apparent limited success in fighting the occurrence of teen pregnancies might be a misconception among authorities and academics on the actual causes of the problem. As a contribution to the existing literature, the Christian Michelsen Institute (CMI) in cooperation with NHH Norwegian School of Economics, Femina HIP, the Economic and Social Research Foundation (ESRF), and the Development Pioneer Consultants (DPC) launched a project called *"Economic Empowerment – The Best Contraceptive?"*. The core intention of the project is to gain a better understanding of the factors guiding girls' fertility decisions and how those interact with their economic situation (Tungodden, 2013). Two intervention programs, one focusing on health information and the second on business knowledge, are introduced to a total of 80 schools, representing 3482 girls. Comparing the outcomes of both interventions on the girls' fertility decision then provides information about which one is more effective in lowering the girls' vulnerability to early pregnancy: information on sexual health or economic empowerment.

This master thesis is a contribution to the Girl Empowerment Project. Making use of the primary data collected during the baseline survey in April-May 2013, the subsequent analysis sets out to assess the link between the types of knowledge underlying the intervention programs and the girls' fertility aspirations, prior to the exposure to any kind of treatment. Thus, the guiding research hypothesis of this paper is:

What is the link between the fertility aspirations of young girls in Tanzania and their level of health knowledge and business knowledge?

Therewith, this study shows to what extent health- and business knowledge are connected to a more empowered attitude of young girls in Tanzania at a pre-intervention state of the Girl Empowerment Project. Ultimately, the results shed light on whether girls depicting higher levels of either type of knowledge prove to have a certain attitude towards family planning and sexual behavior that is associated with a lower vulnerability to early pregnancy. The results in this thesis can shed light on which dimensions seem to be important for health plans, and can be thus useful for the design of the follow-up analysis.

3

1.3 Outline

The first part of this thesis provides an overview of existing literature on the use of information campaigns and business empowerment as treatment methods. Looking at previous research examples employing one or the other technique, the motivation underlying the choice and setup of both intervention programs in the context of the Girl Empowerment Project is described. The second part of this study sets out to assess to what extent country-specific characteristics of Tanzania such as cultural convictions, economic conditions and the educational system support the occurrence of teen pregnancies. The subsequent section introduces the methodology used in the underlying data analysis, which is followed by a thorough presentation and interpretation of the main findings. The paper concludes with a summary of the key results and points to possible outcomes of the Girl Empowerment Project.

2 Literature review

The Girl Empowerment Project aims to evaluate the effectiveness of health information and economic opportunities in changing young girls' fertility plans and decision-makings. In order to test their respective importance, two intervention programs have been designed; an information campaign on reproductive health and gender equality as well as an entrepreneurship training to improve the girls' economic opportunities. A wide range of research experience successfully employing one or the other technique for similar research purposes have inspired both intervention programs. The most relevant examples are presented below and serve as a basis for the subsequent discussion on the implications for the Girl Empowerment Project.

Overall, the literature review is divided into three sections. This first part presents an overview of prevailing literature supporting the use of information campaigns as a mean to empower people through raising awareness. The second part addresses a more recent technique used in the field of development economics, namely empowerment through the provision of economic opportunities. The third part discusses the potential efficiency of the interventions planned under the Girl Empowerment Project.

2.1 Health information campaigns

Information campaigns are one of the most traditional and widespread intervention techniques used in development projects. Their use is based on the assumption that people lack proper information about a certain topic, which hinders them to develop an empowered and responsible behavior. They aim at changing the behavior or mindset of people through the provision of information (Snyder, 2007). The underlying mechanism of this approach is that information is assumed to have the power to raise peoples' awareness and thereby influences their decisions. If targeted at teenagers, information campaigns can easily be incorporated into school schedules and have therewith a practical advantage over more creative techniques in terms of reaching their target group. As they are relatively inexpensive and easily replicable in similar ways at different places, examples of development projects employing this kind of intervention technique are vast. In the following a few project examples applying health information campaigns are provided that are to a certain extent comparable to the setting of the Girl Empowerment Project.

In a study undertaken by (Jalan & Somanathan, 2008) on the effect of information provision on the demand for environmental quality in India, the authors find that a negative mindset such as in the case at hand 'the lack of demand for environmental quality' is mainly caused by the lack of access to relevant information. The researchers observed that people were unwilling to financially support actions to improve the quality of their drinking water, which was partially contaminated. However, after receiving information on whether or not a household's individual water source was contaminated, they turned out to be more motivated to pay for purifying their water. Thus, the authors conclude that by giving people access to relevant information, they are able to make more qualified decisions, which often results in a more responsible and desirable outcome. A similar study conducted by Madajewicz et al. (2007) on arsenic water wells in Bangladesh points to the same conclusion. Analyzing how information on water quality affects peoples' willingness to switch wells, the authors find a large and rapid response to information. Households receiving information about the quality of their drinking water were willing to bear even relatively high costs in order to circumvent the health threats related to drinking arsenic water. A range of further studies supports the positive impact of information on peoples' decision makings such as the one undertaken by Fitzsimons et al. (2012). The authors found a positive response of households in Malawi in form of increased overall food consumption, especially of protein-rich food consumed by children, as a result of an information campaign on child nutrition and health. The study that probably comes closest to the setting of the Girl Empowerment Project was conducted by Dupas (2011), who evaluated the impact of information on the sexual behavior of young women in Kenya. In this scenario, informing the girls about the higher risk of HIV infection during intercourse with older men led to a significant decrease of the same.

The common ground of all these studies is that people tend to be more responsible than we sometimes give them credit for. As advocated by supporters of information campaigns, the key to unleashing this potential relies in the provision of the right kind of information, as only people who are aware of certain risks will be motivated to engage in actions to circumvent them.

2.1.1 Implications for the health information treatment

The literature review on the application of information campaigns in similar research settings reveals that the provision of information has often shown great success in influencing peoples' decisions to the better. However, it is crucially important to understand the

surrounding conditions triggering such an immediate response of the target audience and to raise the question of whether the described interventions led to a sustainable and long lasting change in behavior. While a rapid response to information is possible and of course desirable, the prevailing opinion in economic literature emphasizes the rather slow nature of behavioral change (Madajewicz et al., 2007). Contrary to the immediate responses observed in the above mentioned research examples, a change in behavior that cuts more severely into peoples' habits is expected to take a lot more time and to depend on many additional external factors that might not be affected by the pure provision of information (Madajewicz et al., 2007). This implies that some project settings are not as suitable for the application of information campaigns as others. It also shows that it is important to have a clear idea about the ultimate goal of an intervention, to have identified a specific and coherent target population as well as an appropriate communication strategy when assessing whether or not an information campaign is the right technique to use (Snyder, 2007). If one of those aspects is not in line with the rest, the intervention is unlikely to result in the desired change of behavior.

With regards to the health information campaign planned under the Girl Empowerment Project, those findings imply that its success in postponing the initial age of childbearing is highly dependent on the holistic understanding of the surrounding project conditions. As the project targets teenage girls in the last class of their secondary education (Form IV), integrating the campaign into the school curriculum allows for a specific outreach to the target group. To achieve the ultimate goal of avoiding pregnancies at this state in life, promoting responsible sexual behavior techniques appears to be a proper communication strategy. As observed during the baseline study, the existing knowledge about sexual health amongst the girls is relatively poor so that we can expect the lack of information to be part of the problem and by consequence a significant change in behavior in response to the provision of comprehensive information.

2.2   Economic empowerment

The economic opportunity treatment of the Girl Empowerment Project was inspired by a growing conviction in development economics that entrepreneurship targeting girls is a meaningful tool to fight teen pregnancies in developing countries (Ashburn & Warner, 2010). In their study on economic empowerment, the authors establish a clear link between weak economic positions of girls and a high-risk sexual behavior that is ultimately linked to higher

vulnerability to early pregnancy. As discussed in the following paragraphs, the effect of business education on girls is twofold. On the one hand, the girls themselves benefit on an individual level by acquiring transferable skills and knowledge increasing their chances of becoming economically active and therewith more independent from men. For the society overall, encouraging women to pursue entrepreneurship is positively impacts the overall economic development of the society as through the positive side effects of entrepreneurship such as the generation of new employment opportunities throughout the community (White & Kenyon, 2001). Especially in rural areas self-employment constitutes an important source of employment as those areas are generally characterized by low levels of business presence and a consequential lack of employment options in the formal sector (Debrah, 2007).

2.2.1 Importance of business education in fostering entrepreneurship

Despite its incremental importance for generating jobs, particularly in comparatively poor regions, the informal sector in Sub-Saharan African (SSA) countries is rather underdeveloped. One possible reason hindering the development of entrepreneurship in developing countries is presented in a paper by Ghai (1988) who conducted a study on youth entrepreneurship in developing countries. He identified the level of business education amongst adolescents as insufficient, rendering a successful entrance in self-employment difficult. Studying the situation of young entrepreneurs in Tanzania, the authors find that compared to adults, adolescents engage in only marginal economic activities that are partially inefficient and of short-lasting nature. Those findings are supported by Mulenga (1997) who observed problematically low levels of motivation, entrepreneurial spirit and patience of young entrepreneurs in Zambia. Thus, the poor entrepreneurial qualities amongst adolescents in SSA due to partially unadjusted educational programs and an overall lack of motivation are amongst the most important reasons hindering the development of entrepreneurship in regions where it would be most needed. Even though the studies at hand did not look into differences in the level of motivation depicted amongst boys and girls it seems likely that girls are even less ambitious to become self-employed as they might be confronted with higher social obstacles of becoming economically active. As explained in section 3 of this study, rural Tanzania is largely characterized by a rather tradition perception of gender roles rendering it unlikely for girls to get a lot of support from friends or families to dare the step into self-employment.

In light of those findings, the role of education in fostering entrepreneurship among women stands out as an essential key to success. In recent academic literature, the role of business education in fostering entrepreneurial motivation has mostly been discussed within the context of microfinance. A few of the most relevant findings on the relevance of business education as a crucial element in efforts promoting entrepreneurship in developing countries are summarized below.

In its early beginnings, microfinance programs mainly identified the lack of access to capital as the crucial limitation for the development of entrepreneurship in developing countries. However, the observed high failure rates among those emerging entrepreneurs have over time directed the attention of microfinance related research towards the importance of proper business education as a component of successful economic empowerment programs. One significant contribution to this discussion was made by Berge et al. (2011) who conducted a study on microfinance projects in Tanzania. The research revealed that in the long-term, human capital development proved to be even more essential to the success of micro-entrepreneurs than access to capital itself. On a similar note, Karlan & Valdivia (2011) investigated the comparative impact of business training and financial support on the success of micro-entrepreneurs in Peru. While the authors did not find any evidence that participants receiving additional trainings performed differently on indicators such as business revenue, profit or employment, they nevertheless recorded improvements in business knowledge as a result of extra training. Furthermore, the finance institutions recorded a high customer retention rate of those receiving extra training. The latter result could be interpreted in a way that business training inspires people, provides them with new ideas and makes them overall more motivated to pursue a career as an entrepreneur. This interpretation is coherent with the findings obtained in a study of Bjorvatn et al. (2012) on the impact of the entrepreneurial education television show 'Rukka Juu' in Tanzania on adolescents' perception of entrepreneurship. While the effect on actual knowledge acquisition was inconclusive, project participants and females in particular proved to feel inspired by watching the contestants succeeding in building up and running their own businesses.

Recognizing its potential to generate employment opportunities, entrepreneurial education recently became one of the top priorities of public policies in Namibia (Mbaziira, 2007). According to a survey conducted among the project participants, the biggest challenges for entrepreneurship in Namibia also relied in the overall lack of motivation among young

entrepreneurs as well as in a general lack of sufficient business knowledge and orientation in the business world. As a consequence, integrating extensive business training as a part of the school curriculum proved to be successful in motivating adolescents to pursue a career as an entrepreneur and to be more successful while doing so. The approach to integrate nationwide business training initiatives into the school curriculum is supported by the findings of Harris (2003), who point out that self-employment is an especially interesting career option for adolescents not continuing to tertiary education, as those are less likely to find employment in the formal sector. As the failure rates of the final secondary school exam are persistently high in most developing countries including Tanzania, exposing students to the option of becoming self-employed at a state prior to the final exam makes particular sense. In that way, students failing the exam will feel more at ease in pursuing an alternative career as an entrepreneur as they just have been provided with the necessary skills to do so. Due to the similarity of this initiative to the setting of the Girl Empowerment Project in Tanzania, the overall positive outcome of the program implemented in Namibia lead to the expectations that the planned business intervention might turn out to be effective in empowering women to pursue a career in self-employment.

Finally, in 2012 the International Labor Organization (ILO) provided one of the most interesting studies published in terms of comparability to the setting surrounding the Girl Empowerment Project. Selecting areas in Tanzania that are particularly affected by HIV/AIDS, the ILO conducted a study on how impactful an intervention treatment based on economic empowerment is in reducing the risk of applying risky sexual behavior. In many ways the study parameters, such as the target country, intervention method as well as the attempt to influence peoples' sexual behavior, resemble the design of the Girl Empowerment Project. Despite some differences, the study outcome has some important and motivating implications for the possible effectiveness of the business training intervention of the Girl Empowerment Project. The findings suggest that providing the project participants with economic skills and therewith an economic perspective proved to be efficient in leading the target group towards more risk-averse sexual behavior (International Labour Organization, 2012). The authors found out that people often engage in risky sexual actions as a result of financial distress. Consequentially, they created an intervention that provides not only information on the risk of HIV infections but also the necessary skills to engage in alternative income generating activities. This holistic approach is likely to lie at the heart of the success

of the intervention and entails some important implications for the successful design of the Girl Empowerment Project.

2.2.2 Implications for the opportunity treatment

Previous attempts in designing economic empowerment projects show that business trainings can serve as an efficient tool to foster entrepreneurial spirit amongst adolescents in developing countries and girls in particular. Applying a holistic approach, both, motivation as well as business skills and knowledge can be passed on to the target group, rendering the successful entrance into entrepreneurship more likely. Experience from Namibia has shown that targeting such training interventions at students in the last class of secondary school might help to overcome one of the shortcomings of previous entrepreneurship programs that mostly focused on the broad mass of unemployed adolescents at a post-school stage. Thus, a proper training at a secondary school level, prior to the actual business implementation stage and free of any long-term commitments, is expected to help girls to discover and develop their entrepreneurial skills while simultaneously deter others that don't display the qualities required to become a successful entrepreneur and thereby protects them from fatal and costly failure experiences.

2.3 Conclusion

Having discussed both intervention techniques in the broader setting of existing research and relevant literature, the final part of this literature review concludes by discussing the expected efficiency of the planned interventions under the Girl Empowerment Project.

It was shown that in cases when information is scarce, providing relevant information to the target group can have a large and rapid impact on peoples' decision makings. As addressed in the data analysis section of this study, the knowledge about sexual health matters depicted amongst the project participants is relatively poor. Thus, we might expect the health knowledge intervention to effectively increase the girls' awareness about the risks attached to early pregnancies and thereby change their willingness to act accordingly. However, whether or not better knowledge is enough to provoke a significant change in behavior remains to be seen. The general perception in academic literature is that while proven to be effective, information alone only impacts behavior if the 'alternative option' proposed by the information campaign is realizable and perceived as more or at least equally rewarding in the

eyes of the target group. To exemplify, this implies that even if the girls in the sample had a good understanding on how to prevent pregnancies, they would still chose the option of early motherhood as a result of lacking alternative options for their post-school future. If the girls don't qualify for further education and don't feel they possess the necessary skills to engage in any kind of economic activity, motherhood appears to be the only remaining socially acceptable 'career choice'. Being a mother and wife guarantees for at least a certain level of social recognition, which girls are only likely to give up for an equally rewarding option. In this context, the business training intervention can be a crucial tool to encourage the girls to actually pursue a different career choice after secondary school as it provides them with the necessary skills and knowledge to do so. As supported by recent academic literature, the opportunity treatment is expected to provide both, a motivation for suitable candidates to dare the step towards entrepreneurship while simultaneously reducing the risk of failure at a later state due to its holistic approach in communicating relevant entrepreneurial skills.

Summing up, while we expect an overall increase in health knowledge as a result of the information treatment, the opportunity treatment is likely to be more powerful in terms of impacting the girls' actual behavior and their according exposure to the risk of early pregnancy. With regards to the analytical part of this research paper, it is important to keep in mind that the data underlying this study is unable to provide any conclusive answers on the final effect of the interventions on the girls' behavior. This final evaluation of the program is going to follow at the end of the Girl Empowerment Project in 2014.

3 Institutional setting

As the ultimate goal of the Girl Empowerment Project is to postpone motherhood to a more mature age, it is of incremental importance to understand to what extent country-specific characteristics of Tanzania hinder or support the occurrence of early pregnancies.

We can assume that the number of adolescent mothers depends on the degree to which a country's cultural convictions, gender perception, economic wealth and educational system are conducive to early pregnancies. The following section is therefore dedicated to an analysis of these elements, by first providing an overview of key facts about the socio-economic situation in Tanzania and the resulting challenges to current public policies. The second part discusses how the girls' family background impacts the prevalence of early pregnancies before the final section looks into the highly important issue of girl education. The following analysis reveals that the country's cultural convictions, economic conditions and particularly educational system impact the livelihood of adolescent girls in a way that is conducive to the occurrence of teen pregnancies.

3.1 Key facts about Tanzania

The girl empowerment study is conducted in Tanzania. The country as we know it today has emerged after the unification of Tanganyika and Zanzibar in 1964. Located in Eastern Africa, it has a population of over 48 million. Ranking among the poorest countries in the world in terms of per capita income, about 36 percent of the population live below the poverty line; A phenomena which is much more pronounced in the rural areas of the country (Central Intelligence Agency, 2013). Accordingly, one of the major economic challenges faced by the current government is to find means to combat the overall high rates of unemployment and to support the development of economic sectors in order to reduce the high economic dependency on the agricultural sector which nowadays accounts for over 80 percent of existing employment opportunities. Especially in light of the predicted economic slowdown over the next decade, a very young population with a median age of 17.3 years and overall prevailingly high rates of youth unemployment[1] and illiteracy[2], Tanzania's key to economic

---

[1] 8.8 percent of the total labor force ages 15-24 unemployed during a specified year (CIA, 2013)

[2] 30.6 percent of total population aged 15 and over can't read or write Kiswahili (Swahili), English, or Arabic (CIA, 2013)

13

prosperity and growth relies in the government's ability to create economic perspectives for the upcoming generation (Central Intelligence Agency, 2013). As addressed in the previous section, the inclusion of girls in this process is of incremental importance to ensure a sustainable development of a society and its economy. From a social perspective, it is noticeable that Tanzania ranks among the 20 fastest growing countries with one of the highest teen pregnancy rates in the world. With an average birth rate of 5.01 children per woman, the mean age for initial childbirth is centered around 19.5 years (NCCR, 2012);(Central Intelligence Agency, 2013). Tanzania's educational system is composed of three consecutive levels, namely the basic, secondary and tertiary level (Government of Tanzania, 2013). If students accomplishing both, primary and secondary school, they obtain a maximum of 13 years of education before they can continue to tertiary level education. Since the introduction of structural changes in the educational sector in 2000, the 7 years of primary education are now compulsory to all children in Tanzania including girls. As those policy changes are rather recent, the average years of education received during a life-time for adults above the age of 25 still remains at a modest 5.1 years (UNDP, 2013). In line with those statistics, the society overall is characterized by a rather traditional understanding of role allocations between men and women, leading to significant gender inequalities especially with regards to secondary and tertiary education and women's ability to pursue any form of income generating activity during their lifetime (NCCR, 2012).

3.2   Family background

One of the most relevant factors essential to the discussion about teen pregnancies is the economic background of the girls' families. As explained in the following paragraph, the perception of the appropriate age of marriage, sexual behavior as well as school education for girls varies widely with the economic situation of families. The analysis depicts a clear tendency of relatively poor families to favor a more traditional future for their girls involving motherhood and marriage at a comparatively young age. These disparities prove to partially explain the lower median age of females entering marriage in rural areas (18.3 years) as compared to urban areas (19.8 years) (Muthengi-Karei & Erulkar, 2012).

As briefly touched upon in the introductory part of this paper, early marriages often place girls under the obligation to start a family at a relatively young age. This link is supported by the observation made in a survey on delaying marriage in rural Tanzania by Muthengi-Karei

& Erulkar (2012). The authors found evidence that girls of the same age group are much more likely to become pregnant if they are in a formal marriage than if they are unmarried but still sexually active. At the point in time when the survey was taken, the percentage of married and unmarried but sexually active girls being pregnant was 71 percent compared to 8 percent respectively. As reported in the demographic and health survey 2010, about two-thirds of Tanzanian women are married before they turn 20. As the typical age range of girls in Form IV lies between 16-19 years, this number implies that a substantial part of the school-attending girls get pregnant before they finish secondary school. Consequentially, early marriages are strongly associated with lower educational performance and high school dropout rates (National Bureau of Statistics, 2011).

The survey outcomes of Muthengi-Karei & Erulkar (2012) suggests that one of the underlying reasons for parents to advocate marriage at a young age is that bride prices are involved in over 70 percent of the cases. In light of the high poverty rates in rural Tanzania, those bride prices can constitute a substantial source of income for families in times of financial distress and thus can be a strong motivation for parents to push their girls towards early marriages. At the same time, 50 percent of the parents of girls who marry early reported to not perceive education for girls as beneficial in terms of generating future family income. Indeed, the percentage of girls in rural areas engaging in income generating activities after finishing school is low, discouraging parents to invest in the rather costly secondary education in the first place. In line with those findings are the study outcomes obtained by the NCCR (2012). Analyzing the mechanisms behind Tanzania's high rates of adolescent pregnancies, the researchers found evidence that social and family pressure in particular is often at the source of the problem. During interviews with 1250 young women between the age of 15 to 19 in urban and rural settings, the girls reported that family members encourage them to get involved with so called "sugar-daddies" as a means to contribute to the overall household income. Sugar daddies are older men who offer young girls financial and material incentives in exchange for sexual intercourse. The study also revealed that girls with a higher awareness of the risks related to sexual relations with older men and an overall better understanding of sexual health are more likely to resist advances of men and apply a less risky sexual attitude (NCCR, 2012).

To sum it up, the traditional view on family planning and the role of females within the society leads to a wide acceptance and support of early marriages throughout the society

thereby enhancing the occurrence of teen pregnancies. Furthermore, poverty, which is much more pronounced in rural areas, stands out as an important factor conducive to teen pregnancies. Next to their often limited financial means to support their children's education, parents with lower economic resources have proven to perceive girl education as less beneficial and to promote both, marriages at an early age and the engagement in sexual relationships with older men to a larger extent than their wealthier counterparts.

3.3 The role of education

In line with the country specific socio-economic challenges identified in the introductory part of this section, improving the situation and perspectives of Tanzania's youth, and adolescent girls in particular, has become one of the main focus areas of current development enhancing public policies. The experience of OECD countries suggests that the accessibility and quality of the education provided is strongly associated with the average woman's age at first childbearing. In line with this argument are the findings published in the Demographic and Health Survey (2011), predicting a negative relationship between the level of education obtained and the girls' age when entering marital and family life. The results indicate that girls with at least some secondary education marry on average five years later than girls never attending secondary school[3] (National Bureau of Statistics, 2011). In this context, generating broad access to high quality education is crucial to the success of reducing the number of early pregnancies and their considerable negative side effects on the livelihood of young women. However, as elaborated upon in the subsequent paragraphs, providing girls with both, access to and high quality of education remains a major challenge to public policy makers in Tanzania.

3.3.1 Access to education

Overall, the educational situation in Tanzania is improving as a result of two reform programs launched in 2000, bringing the country drastically closer towards the second Millennium Development Goal of increasing primary school enrollment rates. Due to fundamental changes in the educational sector, including the elimination of primary school fees and the

---

[3] Age at marriage for girls with/without secondary education 23.6 vs. 17.5 years.

compulsory attendance of primary education, Tanzania records an impressive increase in school enrollment rates over the past decade. In 2011, net primary and secondary school enrollment rates reached 94 and 30 percent respectively, compared to only 59 and 6 percent in 2000 (USAID, 2013). Despite the success of generating universal access to primary education, the ministry of education currently struggles with the persisting problems of high absenteeism and drop-outs rates. For the year 2010, the official numbers of students dropping out of primary school and secondary school respectively lie at 68,000 and 66,000, with the highest repetition and dropout rates recorded in Form IV (USAID, 2013). As addressed more carefully in the section on disparities in education, the rates for both, absenteeism and drop outs are substantially higher for girls than for boys (USAID, 2013). This claim is supported by the previously presented findings on gender role perception and the resulting lower appreciation of girl education in the Tanzanian society. Additionally, our own research experience in rural Tanzania confirms that high absenteeism rates among girls in Form IV are extremely common and perceived as one of the main challenges to female education amongst teachers and headmasters. With their report on "Transforming Education for Girls in Tanzania", the NGO Action Aid has made a valuable contribution to the discussion about factors leading to such high rates of absenteeism among young girls in Tanzania. Within six different regions the authors investigated upon the girls' personal perception on what hinders them from achieving their desired level of education. It is striking that early marriage, pregnancy and poverty rank amongst the top three explanatory factors (table 1).

Table 1: Obstacles to girls' access to education, in % by district

	Arusha	Monduli	Moshi	Hai	Babati	Mbulu	All
Early marriage	60	65	36	26	24	20	35
Pregnancy	55	85	59	37	51	58	54
Poverty	88	50	8+	62	81	40	61
Too old for class	12	1	7	0	7	1	4
Lack of facilities	29	8	41	63	45	16	31
Distance from school	25	4	6	4	7	6	7
Ill health	31	17	38	29	27	43	28

Source: (Tungodden, 2013)

3.3.2 Quality of education

As previously mentioned, not only the access to education but also its quality is crucial to equipping young people with the necessary skills and knowledge to pursue a professional career after school. While the increase in Tanzania's school enrolment rates certainly represents a positive development in terms of increasing the access to education also for relatively poor members of the society, the quality of education has suffered from the sudden increase in students. This is especially true for primary education, as the government failed to adapt the school facilities, number of qualified teachers, educational material as well as school infrastructure according to the massive increase of students. While there are wide disparities across the different regions in Tanzania, with the rural regions like Tabora being worse off than urban areas such as Dar-Es-Salaam, this massive expansion of school enrollment rates resulted in an average student-teacher ratio of 49:1. The consequences are overcrowded classrooms and overcharged teachers who struggle to design their lessons according to the different needs and states of knowledge of the up to 200 students combined in the same class.

An alternative or supplementary element challenging the quality of the educational system in Tanzania is related to the bilingual setup of the school curriculum. While the official language of instruction at the primary school level is Kiswahili, secondary education is entirely taught in English with Kiswahili remaining only a compulsory subject. As suggested by Rugemalira (2005) as well as many other advocates of adopting one single language of instruction throughout the entire Tanzanian school system, this switch from Kiswahili to English significantly impacts and in most cases diminishes the quality of education and by consequence the performance outcomes measured across students. The severity of the situation became obvious in the outcome of the Certificate of Secondary Education Examinations (CSEE) in 2012. Over 65% of Form IV students failed the final exam in that year, unleashing a heated political debate about how to improve the overall quality of the educational system (Balile, 2013). These high failure rates are especially worrisome with regards to women as only students passing the final exam of secondary school are offered the opportunity to continue to tertiary level education. Not passing Form IV evaluations puts many girls into a vulnerable position as they often don't have alternative plans for their after school lives and are thus much more likely to start a family right away (USAID, 2013).

3.3.3 Disparities in education

Next to the importance of quality, the issue of gender balance is crucial to the discussion about the ability of education to foster girl empowerment. In Tanzania, statistics show proof of certain inequalities within the educational system with regards to region, socio-economic status and gender of the students (USAID, 2013).

With respect to the disparities in educational quality among the different regions in Tanzania, a clear gap between urban and rural areas emerged. As shortly touched upon before, schools in urban areas like Dar es Salaam and Kilimanjaro are not only characterized by a lower student-teacher ratio but also by a higher qualified workforce and better school equipment. Additionally, children growing up in urban areas are more likely to attend school than their rural counterparts. Both, higher quality education and higher attendance rates in urban areas ultimately result in an overall better performance of students living in urban areas (USAID, 2013).

As briefly elaborated upon in the socio-economic section of this paper, performance discrepancies between pupils of relatively poor families and those stemming from wealthier families do exist. The data of a survey conducted by the USAID in 2013 reveals that the majority of students who continue education beyond primary levels come from families belonging to the upper $2/5^{th}$ wealthiest part of the population (USAID, 2013). Next to the fact that wealthier families have more means to support their children's education, students growing up in better economic conditions are less likely to be obliged to contribute to household income or to take over time consuming household tasks. By consequence, they have more time to study for school and thereby to achieve better results. A different explanation could be that a higher wealth indicator is associated with better nutrition of children. Better nourishment in turn fosters concentration and overall cognitive abilities so that children receiving regular and more diverse meals tend to have higher levels of concentration and by consequence perform better in school (Alderman, Hoddinott, & Kinsey, 2006).

The third disparity is grounded in gender differences. It is striking that boys in Tanzania achieve higher performance outcomes than their female counterparts (USAID, 2013). Additionally, while girl enrollment rates in primary education have caught up with the rate for boys, a significant difference in school enrolment between boys and girls emerges after the age of 13/14. Furthermore, absenteeism is substantially higher for girls formally enrolled in

19

secondary education than for boys of the same age group. Thus, taken together, teenage girls are less likely to be enrolled in secondary education as well as less likely to be present in school (United Nations Tanzania, 2013). The underlying reasons are deeply grounded in cultural values, economics and legislations as further elaborated upon below:

Cultural wise, the attitude towards women, family planning, marriage, and income generation in Tanzania is very traditional. In that way, it is much more common for girls to take over a substantial part of the household work such as cleaning, cooking, getting water etc. at a relatively early state of their lives. As a consequence, even though the numbers are slightly increasing, girls are generally less likely to attend school, as they simply do not have the time to do so. Furthermore, many families do not see the value of providing their girls with education as the general expectations for women is to manage the household and raise children as soon as they get married and not to become economically active. This holds especially true for secondary education as unlike primary education, secondary schooling comes at a cost to the parents in terms of school fees (Ricketts & Covington, 2012)

On top of those discriminatory socio-cultural perceptions, educational policies further add to the difficulties young girls face in attending higher education. Whilst it is a known fact that young marriage often leads to early pregnancies, the government has not managed to adapt the legal age of marriage for females accordingly, which is still at the age of 15. On the other hand, even though the bargaining power of young women are often minimal when it comes to condom use or other sort of sexual protection, getting pregnant is generally perceived as the girl's fault and is therefore a valid reason to exclude girls from school (UNICEF, 2003). Thus, neither educational nor family policies are protective of the girls' right to education but instead conducive to the problematic of low levels of education and lacking economic perspectives of young girls in Tanzania.

To sum it up, despite Tanzania's success to substantially increase the number of girls enrolled in primary education, the educational system itself as well as the socio-economic and legislative factors surrounding it are not particularly conducive to girls' education. By consequence, there is a substantial gender gap in terms of secondary school attendance, and overall performance. The further reaching implications of this observed disadvantage of girls are that contrary to their hopes and plans observed during the baseline survey, the girls often fail to finish secondary school and by consequence have very limited opportunities to engage in income generating activities afterwards. Instead, as supported by the persistently low mean

age of initial child-birth, most girls enter family life and marriage at a young age, further reducing the likelihood of them ever pursuing some kind of professional career.

3.4   Conclusion

The analysis of the institutional setting in Tanzania revealed that despite many efforts to improve the situation of young girls, the country still depicts certain cultural, political and economic features that are conducive to early pregnancies and thereby put adolescent girls in a disadvantaged position with regards to personal development, health, education and family planning. Thus, we can conclude that the most vulnerable girls to early pregnancy live in rural areas and come from relatively poor family backgrounds. Those girls are exposed to high social pressure that encourages marriage at a very young age and/or sexual intercourse with older men in exchange of gifts and money. From an institutional point of view girls are further disadvantaged since they are less likely to have access to higher forms of education such as secondary school and if enrolled, depict higher rates of absenteeism and failure rates. Both are partially related to the rather traditional gender perception that marks the Tanzanian society and the accordingly lower importance of women's education.

4   Methods

The subsequent chapter presents the research methods applied in the Girl Empowerment Project. The first paragraph elaborates on Randomized Controlled Trials (RCT) as the chosen research design of Girl Empowerment Project. The second part provides some insights into the data collection process applied in the field, which is followed by an explanation about the sampling procedure and consequential choice of project participants. Chapter 4 ends with some remarks about the analytical approach used to extract and process the collected data and a concluding discussion about the study's limitations and validity.

4.1   Research design

The research design provides a framework to guide the data collection and analysis of a research project. Therefore, it is crucial to identify the appropriate research design that suits the objective and nature of the data used in the study at hand (Yin, 1994). Given the Girl Empowerment Project's main objective of increasing the prevailing understanding of young girls' fertility decisions and to design an intervention program with scaling-up potential, the Randomized Controlled Trials (RCT) methodology is identified as the most suitable methodological approach (Tungodden, 2013).

The power of the RCT methodology comes from its ability to generate the highest possible level of comparability between the different groups under investigation. As argued by advocates of the RCT methodology such as the World Bank and Duflo (2004), randomization reduces the risk of imbalance between the groups of participants and thereby guarantees that, on average, any significant difference in the outcomes observed among different groups is driven by the treatment itself and not caused by any other external or internal factor (Stolberg, Norman, & Trop, 2004).

Applying this method, the 80 schools in the sample were randomly assigned to one of the treatment groups or the control group so that each of the four groups contains 20 schools. Within the treatment group, we need to distinguish between three kinds of interventions, the health information-, opportunity- and the combined treatment. Thus, while the content of the interventions differs, their implementation was aligned to the highest degree possible in order to limit the degree to which external elements create bias in the study outcome. All interventions are planned to take place after regular school hours in a classroom setting and

are conducted by local teachers who receive upfront training and education specific to the field of expertise they are supposed to teach. During the information treatment, the girls are provided with information on reproductive health, gender equality and rights. The program incorporates both practical as well as objective information about sexual behavior and was designed in close cooperation with Femina HIP. Especially with regards to the sensitivity of the issue of sexual behavior, the long lasting professional experience of Femina HIP in the field of sexual education of women in Tanzania was crucial to the proper design of a well-targeted information campaign. The opportunity treatment on the other hand is an entrepreneurship training aimed to improve the economic opportunities of young women. Inspired by the findings of Berge et al. (2012), the entrepreneurial training includes both sessions targeted at enhancing the girls' entrepreneurial mindset as well as more traditional classes covering typical business knowledge such as customer care, marketing or the pricing of products (Tungodden, 2013). The last treatment group is assigned to receive a cross-treatment, combining elements of both the information campaign and entrepreneurship training in order to analyze possible complementarities in the way both treatments work (Tungodden, 2013). The fourth and final group of schools in the sample forms the control group and does by consequence not receive any kind of treatment. Through close cooperation with experienced local project partners, the intervention programs are designed under careful consideration of local particularities, cultural environment and existing knowledge levels of the target audience (Tungodden, 2013).

Despite their numerous advantages, RCTs have been criticized by academics such as Deaton (2010), who argues that RCTs are prone to limitations just as any other methodology and therewith can't be perceived as a superior tool to generate evidence in development economic research. He identifies the issues of noncompliance and missing outcomes as particularly challenging in the context of using RCTs. Both topics seem relevant with regards to the setup of the study at hand and are therefore addressed in more detail in the limitations and validity part of this chapter.

4.2 Data collection

4.2.1 Timeline of data collection

The primary data used in the Girl Empowerment Project is collected in a stepwise approach represented in table 2. The data is obtained over a period of about 18 months starting with the

23

baseline survey in April 2013 which is followed by an intermediate follow-up survey in the second half of 2013 and a final survey in 2014.

Table 2: Main activities and milestones of the Girls Empowerment Project

	Year	Quarter
Piloting and baseline survey	2013	1
Treatments	2013	2
Intermediate survey	2013	3
Final survey	2014	2-3

Source: (Tungodden, 2013)

The data collected during the baseline phase of the research project essentially concentrates on capturing a wide range of background information on the participants. The data comprised information on their socioeconomic environment as well as their attitudes towards crucial fertility decisions such as family plans and level of current sexual activity. The data obtained at this stage are important for the statistical analysis of the final evaluation of the treatment effect. The purpose of the intermediate survey is to find information on any short-term effects of the interventions on the participants in question and to ensure that sufficient and correct contact details were collected during the baseline survey. In that way, the intermediate survey provides the possibility to detect possible deviations in the presence of participants during the baseline survey and the intervention state. The main purpose of the final follow-up survey taking place about one year after the implementation of the program is to obtain the same set of data as collected during the intermediate survey with a special emphasis on measuring changes in the girls economic and fertility aspirations. Comparing all three data sets then provides a solid ground for the evaluation of possible treatment effects. Such an in depth impact evaluation builds on the data collected in 2014 and is therewith out of the scope of the present research paper.

The baseline survey is composed of four thematically different sections. In the first one, the personal and family related situation of the girls is assessed in order to obtain a clearer picture of their individual socioeconomic background. The second part investigates the girls' personal beliefs and attitudes towards a variety of family and career related issues. In the third section, questions on business and health knowledge are asked to obtain an indicator of the

24

participants' existing level of knowledge in both areas. The fourth section covers the girls' perception on marriage and family life, including a careful investigation of their level of sexual activity. Most of the questions entailed in section 1 to 4 make use of a closed-question format, predetermining the possible answer categories. As the ability to speak, read and understand the English language is relatively poor in the regions chosen to take part in the study, the questionnaire was conducted in Kiswahili.

The following paragraph shortly addresses the reasons underlying the choice of using questionnaires as the main tool of data collection in the context of the Girl Empowerment Project.

4.2.2   Questionnaires as a data collection technique

The use of questionnaires and surveys has certain advantages over other data collection methods. According to Popper (2005), questionnaires are very practical with regards to their implementation as they allow researchers to obtain information from a large number of people in a comparatively cost and time efficient manner. This is due to the fact that questionnaires are standardized and of rather inflexible nature, which limits their ability to affect the validity and reliability of the study outcome. Other, more flexible techniques such as interviews for example pose much bigger threats to the validity of a certain study outcome as their highly flexible nature renders the comparison of outcomes rather difficult (Milne, Tregidga, & Walton, 2003). However, despite their many positive features, the use of questionnaires is by no means a flawless tool of data collection. Due to their standardized character, questionnaires are prone to interpretation errors because people tend to differ widely in their understanding of the questions provided. Additionally, it is rather difficult to assess if a person answers the questionnaire truthfully or how much thought they put into the answers provided (Popper, 2005).

Nevertheless, as four research teams are simultaneously conducting the study in locally separated areas of Tanzania, the standardized and inflexible nature of questionnaires actually enhances the comparability of the data obtained. Thus, in light of the challenges related to the particular setting of the research project and the long period of time underlying the data collection process, the use of questionnaires is identified as the most appropriate data collection tool. The potential implications of that choice with regards to the validity of the results are addressed in the limitations and validity section at the end of this chapter.

4.2.3 Data extraction

In order to further process the data obtained in the questionnaires, a numerical value is assigned to each answer option and then entered into STATA, a commonly used statistical data analysis program. To analyze the link between business- and health knowledge and the participants' fertility aspirations, a standardized coefficient regression analysis is applied (Noymer, 2010). Coefficients are here expressed as an effect of one standard deviation change in the independent variable holding everything else constant as opposed to a unit change measured by the classical regression (Menard, 2011). Thus, the standardized coefficient approach makes the comparability of independent variables of different units easier by expressing their respective change in a common metric, without affecting the statistical significance of the model (Noymer, 2010). As the variables used in the study at hand are indeed of different nature and consequentially measured in different units, the standardized coefficient regression stands out as the most suitable analytical approach. A more detailed description about the construction of the different variables follows in section 5.

4.3 Sampling

Defining a suitable and representative sample is one of the main challenges to the design of an appropriate research model. The main aim of sampling is to identify people out of an entire population of interest that are representative of the overall target group to a degree that allows for the generalization of the observed outcomes. For the Girl Empowerment Project, the sampling procedure further elaborated upon below resulted in the selection of 80 schools in the regions of Dodoma, Singida, Morogoro and Tabora including a total of 3482 girls. Due to the relatively long time span of the research program and the fact that the girls will be more difficult to locate after leaving secondary school, roughly 20 percent attrition in the number of project participants is anticipated. However, the baseline survey makes use of a thorough contact information collection technique in order to minimize the risk of data incompleteness (Tungodden, 2013).

4.3.1 Defining the target population

The target population of this research project is young girls in the final class of secondary school in Tanzania. Girls of that age group have reached a point in their lives when they are faced with the crucial decision of how to continue after school. The most common options at

this point are either to start a family or to continue to tertiary education. As addressed in section 3, in the past years the large majority of the students attending Form IV failed the final exam. For most of them, failing the final exam puts an end to their career as a student at a comparatively young age. Thus, a lot of the affected girls do not see any real alternative option for their post-school future than to start a family. The previously presented wide-reaching socio-economic consequences of this phenomenon for the individual and the society overall justify the choice of girls in Form IV as the main target group (Government of Tanzania, 2012).

4.3.2 Selecting the sample

The sample selection is conducted in accordance with the unit sampling framework suggested by Zikmund (2003). In a stepwise approach, first the country of interest, then the regions and finally the schools themselves are identified.

As indicated by Demographic Health Survey (2011), the problematic of teen pregnancies is a regional phenomenon in East Africa which also plagues neighboring countries such as Zambia or Kenya (Central Statistical Office, 2009). Thus, while the problem is evidently of regional nature, the willingness of governments to act upon it varies widely across the countries in question. In Tanzania, the high failure rates of the CSEE in 2012 and the strikingly poor performance of girls have recently brought the educational system back on the priority list of public policies and increased the government's willingness to tackle the underlying problems. The support of the ministry of education at both, national as well as regional levels was identified as a crucial success factor, as the official recognition of the project is determinative for the cooperation of headmasters and participants. Thus, the current political environment in Tanzania is conducive to the successful implementation of the Girl Empowerment Project.

The second sampling criterion concerns the choice of the specific regions in Tanzania. Figure 1 provides an overview of the distribution of schools within and between the selected regions of Dodoma, Morogoro, Singida and Tabora. All four regions are located on the Tanzanian mainland and characterized by a predominantly semi-urban/rural population. The decision to focus on rural and semi-urban areas instead of urban areas such as Dar-Es-Salaam, was motivated by the fact that rural regions are marked by higher fertility, unemployment and

poverty rates as well as more pronounced gender gaps in terms of education and economic activity (Balile, 2013); (United Nations Tanzania, 2013).

Figure 1: Distribution of schools in the sample, by region
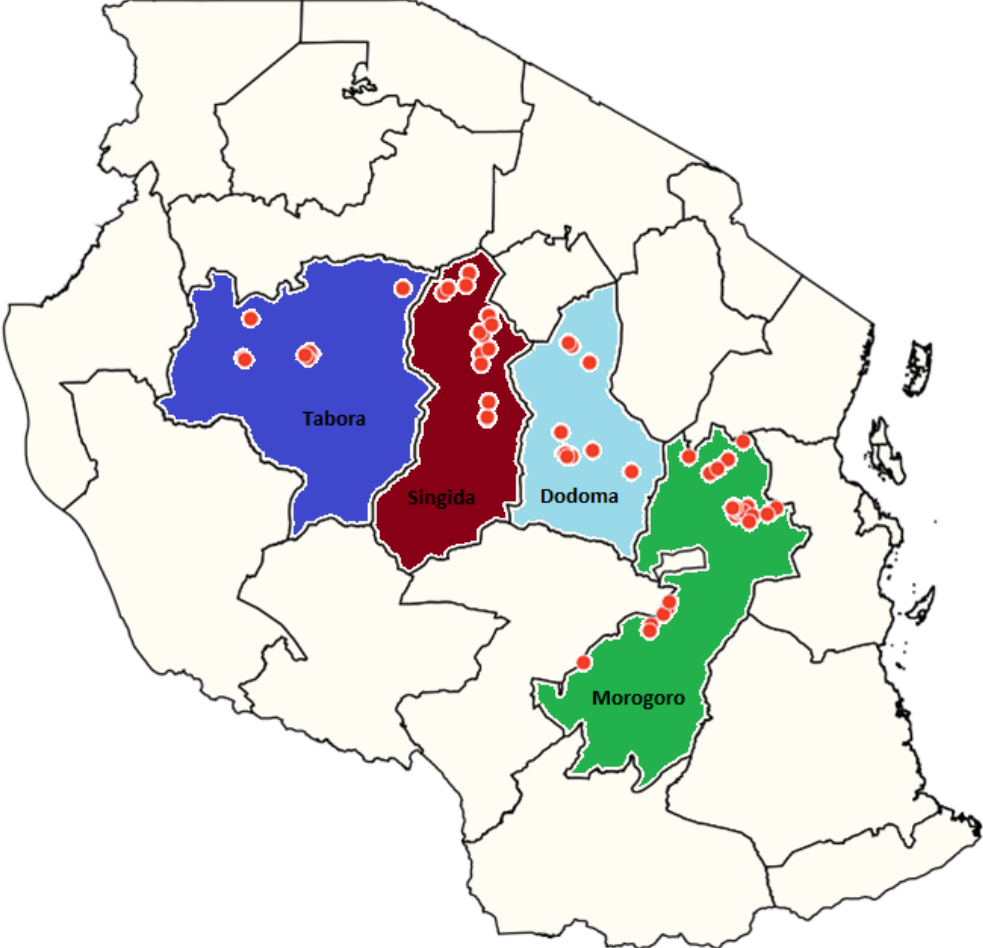
In a final step, the specific schools participating in the project are selected. With regards to the practicability of conducting the treatments, mainly schools with 40-60 girls enrolled in Form IV are targeted. To ensure a sufficiently large sample size, the baseline survey is conducted in 80 schools, represented by the red dots in figure 1, covering 3482 potential project participants. The overall age range of the girls in the sample is 14 to 28 years (see table 5), but almost 80 percent of the girls are either 17 or 18 years old and thus in the desired age interval of the target population previously identified.

Table 3 below shows the distribution of the girls in the sample across regions and streams of education. The participants are spread relatively evenly across the four regions. With regards

to the different streams of education, the majority of girls follow either arts or science and only about 9.5% of the participants are enrolled in the business stream.

Table 3: Overview of participant distribution, by regions and streams

Stream	Morogoro	Dodoma	Singinda	Tabora	Total
			Region		
Arts	808	484	294	351	1937
Business	60	88	38	146	332
Science	245	211	400	357	1213
Total	1113	783	732	854	3482

4.4 Limitations and validity

This final part of section 4 is dedicated to a discussion of the limitations and risks emerging from the chosen research design. The subsequent paragraph identifies some critical issues that might put the results of this study at risk and explains what measures were taken in order to mitigate their impact on the quality of the outcomes obtained.

4.4.1 Non-compliance

The first discussion point is dedicated to the risk of non-compliance, which can lead to biases in the data obtained and thereby affect the validity of the results. In the research design of the Girl Empowerment Project both, the compliance of the individual research teams and of the participants themselves needs to be ensured. In order to guarantee that the four teams simultaneously conducting the surveys in different regions of Tanzania apply identical routines and procedures, a protocol was established that clearly describes the internal and external conditions of the survey. Following that protocol ensured that the survey was taken under similar circumstances, even if some of the elements such as the availability of classrooms, chairs and desks could only be mitigated to a certain extent.

When it comes to the compliance of the participants, the main risk for non-compliance is related to the closed-question format of the questionnaire which could cause misunderstandings and consequentially generate answers that do not properly reflect the actual situation of the participants. In order to minimize misunderstandings of any kind, the

more difficult parts of the baseline survey were accompanied by a moderator, explaining the meaning of the individual questions. Furthermore, the girls were allowed to clarify questions in private with the research assistants present in class; an option they made extensive use of. Additionally, in order to minimize misleading data as a result of incomprehension, the survey was conducted thoroughly in Kiswahili instead of English. The overall knowledge of the English language, especially in rural areas, is very poor so that the use of the English language risked compromising the quality of the data obtained. In order to limit translation biases, a cross-translation strategy was employed. This implies that one group of translators translated the questionnaire from English to Kiswahili while a second independent group retranslated the Kiswahili version into English. Comparing the resulting two English versions and correcting translation errors accordingly led to a Kiswahili version of the questionnaire that is as identical as possible to the original one.

Taken together, while the design of the experiment certainly entails certain risks for non-compliance, those risks were carefully identified and mitigated to the highest degree possible. Adjusting questions and answer categories after the test run helped to minimize understanding problems significantly as did the moderation guiding the participants through parts of the questionnaire. Thus, within limits, the risk of non-compliance can be described as low.

4.4.2 Missing data

The second complication stemming from the chosen methodological approach is related to the occurrence of missing data. Especially in large experiments, the number of participants dropping out before the assessment of the final results can be significant and cause problems in the quality of the final dataset. As it is of incremental importance to the outcome of the study, that the girls participating in the treatment and follow up survey are identical to the ones taking part in the baseline survey, the collection of contact information played an important role in the design of the baseline survey. Concentrating on both personal details such as addresses and phone numbers as well as contact information from friends and relatives, a variety of different contact channels can be exploited which increases the chances of locating the participants after they finish school. The only risk that was rather difficult to mitigate is the one attached to the high rates of absenteeism of girls in school during the day the baseline study was conducted. However, it is difficult to assess the potential consequences for the quality of the data at this point in time.

5 Defining variables

5.1 Dependent variables

Prior to running the regression analysis, the data was transformed and grouped into the dependent variables (1) Sexual Activity and (2) Family Plan represented in table 4. The girls' attitude towards both elements was identified as relevant in determining their vulnerability to early pregnancy as girls who are more positive towards starting a family in the near future and those with a higher level of sexual activity are more exposed to the risk of early pregnancy.

5.1.1 Identification of relevant questions

The dependent variables are obtained by identifying and combining thematically similar questions in the baseline survey. In order to receive a clearer picture of the participants' current level of sexual activity, the answers provided to questions 1 to 5 are bundled as shown in table 4. Those five questions were chosen because all of them measure a certain behavior or knowledge that gives away information on the girls' level of sexual experience. As depicted in table 4, the survey made use of rather indirect questions instead of an upfront direct question format. Such a generalist question style is often applied in academic research when the topic of interest is of sensitive nature and the according risk of obtaining false answers when asking the questions in a more direct way is high. However, within limits, the true opinion of a participant can be estimated using their answers provided to the generalist questions. The reasoning underlying this assumption is that perceiving a certain behavior as common and socially acceptable increases the likelihood of an individual to act in the same way. With regards to the survey at hand, this approach leads to the following expectations: Regarding question 1, girls who believe that a large percentage of her classmates have boyfriends are assumed to be more likely to be in a relationship. Being in a committed relationship is in turn associated with a higher probability of having regular sexual intercourse. The same holds true for questions 2 and 3. Girls who perceive it as normal for girls in their age range to have sexual intercourse or to exchange sexual services for gifts and money are expected to be more likely to engage in such activities that are in turn associated with a higher level of sexual activity. Questions 4 and 5 on the price and use of condoms are included as they shed light on the frequency and regularity of sexual intercourse of the participants. Girls perceiving it as normal to apply condoms during sexual intercourse might

31

be more sexual active and therefore motivated to reduce the risks attached to unprotected sex. In the same way, girls who are familiar with the price of condoms are probably more often exposed to the situation of buying and using them and by consequence sexually active. Thus, within the context of the present thesis, both condom questions are understood as an indication of the girls' overall exposure to sexual intercourse and to a lesser degree as an indicator of how responsible they are when being sexually active.

To obtain information about the girls' aspirations with regards to starting a family, the answers provided to questions 6 to 8 are bundled as represented in table 4. Combining information about the perceived appropriate age of marriage for females with the girls' personal desire for children at a specific age provides a solid idea of whether or not the participants are likely to want to start a family on their own in the near future.

5.1.2 Construction of dependent variables

In a first step, the single questions underlying the dependent variables are transformed into dummy variables. With regards to questions Q1 to Q5, this methodology splits the sample of participants into groups of more and less sexually active girls, represented by the dummy taking the value one or zero respectively. The decision on who falls into what category is made by using the median value for each answer as a threshold level as illustrated in table 4. Taking the example of question 1, the Q1 dummy turns into one (more sexually active) for all girls providing an answer above or equal to the median answer of four. This implies that girls who believe that "over half" or "almost everyone" of the girls in their class have a boyfriend are assumed to be in a relationship themselves and by consequence to be more sexually active. The same approach is applied to turn Q2 to Q5 into dummies which take the value of one to represent the more sexually active girls. Thus, as the median value for Q2 and Q3 is three (="I agree"), all participants who agree to the statements that it is normal for girls of their age to have sexual intercourse or to exchange sex with older men for gifts, fall into the more sexually active category for the underlying question. Consequentially their respective Q2 or Q3 dummy takes the value of one. The median answer of Q4 is two ("I neither agree nor disagree"). Thus, all girls providing an answer equal or higher to two are categorized as more sexually active, represented by the Q4 dummy equaling one. And finally, the Q5 dummy turns into one for all survey participants who answer the price of a package of three condoms correctly.

When it comes to the questions underlying the Family Plan variable (Q6 to Q8), the same methodology is applied (table 4). Transforming the individual questions into dummies splits the sample into two groups that differ in their respective perception on family and motherhood. The dummies of question 6 to 8 take the value one if the participant depicted a rather empowered view on the specific topic underlying the question and zero otherwise. In this context, empowered refers to an attitude associated with entering marital life and motherhood at a comparatively late state in life. Again, the median value per question is used as a reference level to distinguish between more and less empowered points of views. Taking the example of Q6 on the suitable age for females to get married, the girls indicating a minimum age of 21 are categorized as empowered and consequentially less vulnerable to early pregnancy. The Q7 dummy in turn takes the value one for all participants who desire three children or less over their lifetime. And finally, the Q8 dummy turns into one for all girls who want their first child at an earliest age of 26.

Table 4: Summary statistics – Dependent variables

DEPENDENT VARIABLES	Med	Min	Max
Sexual Activity Dummy		0	1
Q1: How many girls from your class do you think have a boyfriend?	4	1	5
Q2: Girls my age typically have sexual intercourse	3	1	3
Q3: Girls my age sometimes receive money or gifts for having sex with older men.	3	1	3
Q4: Girls my age that have sexual intercourse typically use a condom	2	1	3
Q5: What is the price of a package of 3 condoms?	1	1	4
Sexual Activity Index	3	0	5
Family Plan Dummy		0	1
Q6: What is the youngest suitable age for marriage for a female?	21	14	43
Q7: How many children would you like to have during your lifetime?	3	0	10
Q8: At what age would you like to have your first child?	26	18	42
Family Plan Index	1	0	3

Note: Answer alternatives for Q1:1) < 5; 2) 6-15; 3) 16-25; 4) Over half the class; 5) Almost everyone; Answer alternatives for Q2 to Q4: 1) I do not agree; 2) I neither agree nor disagree; 3) I agree; Answer alternatives for Q5: 1) 500 TZS; 2) 1,000 TZS; 3) 1,300 TZS; 4)1,500 TZS

After transforming each individual question into a dummy variable, the dummies of Q1 to Q5 and Q6 to Q8 are summed up to form the so called Sexual Activity Index and Family Plan

Index. Those indexes are by consequence of categorical nature consisting of six and four groups respectively, representing different levels of vulnerability to early pregnancy. The six groups underlying the Sexual Activity Index are represented graphically in figure 7B (page 53) and move from less sexually active (group 0) to most sexually active (group 5) and therewith from less to more vulnerable to early pregnancy. This makes intuitive sense as the higher a girl scores on the Sexual Activity Index, the more sexually active she is assumed to be and the more likely she is to become pregnant at an early state in her life. The groups underlying the Family Plan Index on the other hand move in the opposite direction, with the least vulnerable girls in group 3 and the most vulnerable ones being represented in group 0 (see figure 6B, page 47). As the Family Plan Index is simply the sum of the Q6 to Q8 dummies, each group of the index represents the number of empowered answers provided by the participant. Girls forming group 0 have a very traditional and by our understanding unempowered view with regards to starting a family and are therewith likely to become pregnant in the near future, eventually even before finishing secondary school. Girls falling into group 3 of the Family Plan Index depicted an empowered attitude towards all of the underlying questions, rendering early pregnancy much less likely.

In a second step, the categorical indexes are transformed into binary variables by using the median values indicated in table 4 as a reference level. From now on those binary dependent variables are referred to as Family Plan Dummy and Sexual Activity Dummy. As a consequence of the method applied to construct the indexes, the Sexual Activity Dummy takes the value one for all girls whose Sexual Activity Index is equal to or above three, which in turn represents the most sexually active and therewith most vulnerable girls. Following the logic explained in the previous paragraph, the opposite holds true for the Family Plan Dummy which turns one for the girls least vulnerable to early pregnancy who have an according Family Plan Index above one. The reason to construct dummies in addition to the indexes is to be able to run two regressions with different types of dependent variables and to compare the respective results. Both sets of dependent variables reflect the girls' family plans and level of sexual activity by differentiating between different levels of vulnerability to early pregnancy. The only difference however is that the dummy variable cuts the group of participants into two large groups whereas the index allows for a more refine distinction between the different levels of vulnerability. The first regression that follows in the analytical section of this paper is employing the binary dependent variables. Afterwards, a second regression analysis

includes the indexes as dependent variables. Comparing the outcomes of both regressions thus allows testing the obtained results for robustness and coherency.

5.2 Background variables

Having defined a girl's level of sexual activity and her perception on family planning and motherhood as appropriate indicators to estimate her vulnerability to early pregnancy, the next step is to find background variables that might influence the outcome of the dependent variables.

5.2.1 Identification of relevant background variables

Table 5 presents a summary of the background variables identified as relevant in the context of determining a girl's level of sexual activity and her attitude towards starting a family. The main variables of interest to the statistical analysis following in chapter 6 are health and business knowledge. However, a detailed analysis of those variables follows in section 6.1 so that the following parts focus on the importance of the remaining control variables which are age, math knowledge, business plans, poverty, perception of pregnancy and proactive personality. It is crucial to have in mind that these control variables could be connected to business and health knowledge and by consequence capture some of their predictive power with regards to the dependent variables. Below follow some explanations for why the control variables at hand are relevant for the subsequent regression analysis.

Starting with the age variable, it seems quite intuitive that there is a crucial difference between younger and older girls with regards to their level of sexual activity as well as their feelings towards starting a family. In line with the analysis on gender role perception in rural Tanzania provided in section 3, it is possible that older girls are exposed to more intense social pressure to start a family soon in order to be accepted as a contributing part of society. Math knowledge in turn is an interesting variable in the context of the chosen regression model as one might suggest a certain level of collinearity to exist between the three different types of knowledge under investigation. Math knowledge as a measure of overall intellectual ability could impact the statistical power of health and business knowledge in predicting a girl's attitude towards family plan and sexual activity. Thus, including math knowledge as a control variable allows to investigate if it is actually health and business knowledge that matter or rather higher intellectual ability overall. Coming to the relevance of the poverty

35

variable, the arguments provided in section 3.2 suggest that a girl's financial background might substantially impact her fertility aspirations. It is also possible that poverty is related to the opportunity of acquiring business and/or health knowledge, thereby weakening the individual predictive power of the knowledge variables. The same reasoning underlies the choice of the control variables business plans and proactive personality. Girls who have already today plans to start a business or any intention to become economically active might be more reluctant to start a family in the near future as that would most likely put an end to their career. Thus, it is possible that the actual driver behind the correlation between business knowledge and the dependent variables is the motivation to start a business rather than business knowledge as such. The same logic applies to the variable proactive personality. Girls who believe in risk taking and have more faith in their own ability to influence the direction of their lives might feel more confident in postponing family entrance and motherhood. In this scenario, it would not be the measured level of business and health knowledge that is most relevant in predicting the girls' fertility aspirations but instead her personality. These hypotheses are further investigated in the analytical part of this paper following in section 6.

5.2.2 Construction of background variables

Except for the age and math knowledge variables, the background variables are constructed by applying the same methodology as the one used to form the dependent variables described in the previous section. Figure 2 below summarizes the main steps involved.

Figure 2: Variable construction method

Step 1: Bundling questions	Step 2: Creating dummies	Step 3: Summing up dummies	Step 4: Restructuring groups
Identify thematically similar questions in the baseline survey	Transform questions identified in step 1 into dummies	Sum up dummies constructed in step 2 to generate different groups	Restructure groups obtained in step 3
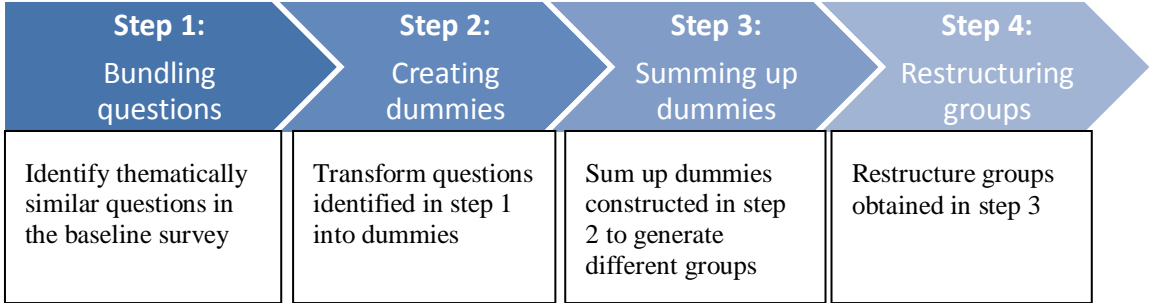
To illustrate this process, the construction of the control variable "poverty" serves as an example and is described in detail in the following paragraph. As a first step, the baseline

36

survey is searched for questions providing information about the girls' level of poverty, which leads to the choice of Q12 to Q15.

Q12: Is the roof of your house made of grass or mud? *1) Yes; 2) No*

Q13: What is the main source of electricity at your house? *1) Electricity; 2) Kerosene lamp; 3) Candles; 4) Solar energy; 5) Other*

Q14: How many times per week does your family eat meat in a normal week? *Answer in number of days per week with 0=never and 7=every day*

Q15: When did you last receive a new school uniform? *1) Less than 6 months ago; 2) Btw. 6 months and 1 year; 3) Btw. 1 and 2 years; 4) Over 2 years ago*

In the second step, the individual questions are transformed into dummies using the median value as a threshold to distinguish between the poor (dummy=1) and non-poor (dummy=0) girls. Therewith, the Q12 dummy turns one for all girls answering that the roof of their house is made out of mud or grass which is an indicator for a comparatively high level of poverty. With regards to Q13 that depicts a median answer value of two, every other source of energy than electricity (answer one) is less sophisticated and therewith an indication for a rather poor family background. Thus, the Q13 dummy takes the value one for all girls who provide an answer equal to or higher than two. With regards to Q14 asking about the number of days the participants' families consume meat at home, the girls indicating to eat meat less than two times per week categorize as poor. And finally, for Q15, all girls who received a new school uniform later than "between six months and a year ago" fall into the poor category for that question, represented by the Q15 dummy equaling one.

Under step three (figure 2), the dummies of Q12 to Q15 are summed up to form five groups of different levels of poverty as represented in figure 3A below, with group 0 capturing the least poor and group 4 the poorest girls in the sample. As shown in figure 3A, only about five percent of the girls in the sample rank above the median poverty level on all four of the indicators addressed in the survey, leading to an unequal distribution of the girls amongst the different groups. Thus, in order to overcome issues of highly unequal distributions, the groups obtained in step three are restructured in the final step four (figure 2). To create the poverty variable as it is presented in the summary statistics of table 5, all participants falling into group 3 or 4 (figure 3A) are combined into the "very poor" category of the poverty variable shown in table 3B. To reduce the amount of different poverty groups from five to a total of

four seems reasonable as the data depicted in figure 3A suggests that girls ranking above the median poverty level for at least three of the questions are already situated at the extreme poverty end of the sample.

Figure 3: Distribution of poverty groups
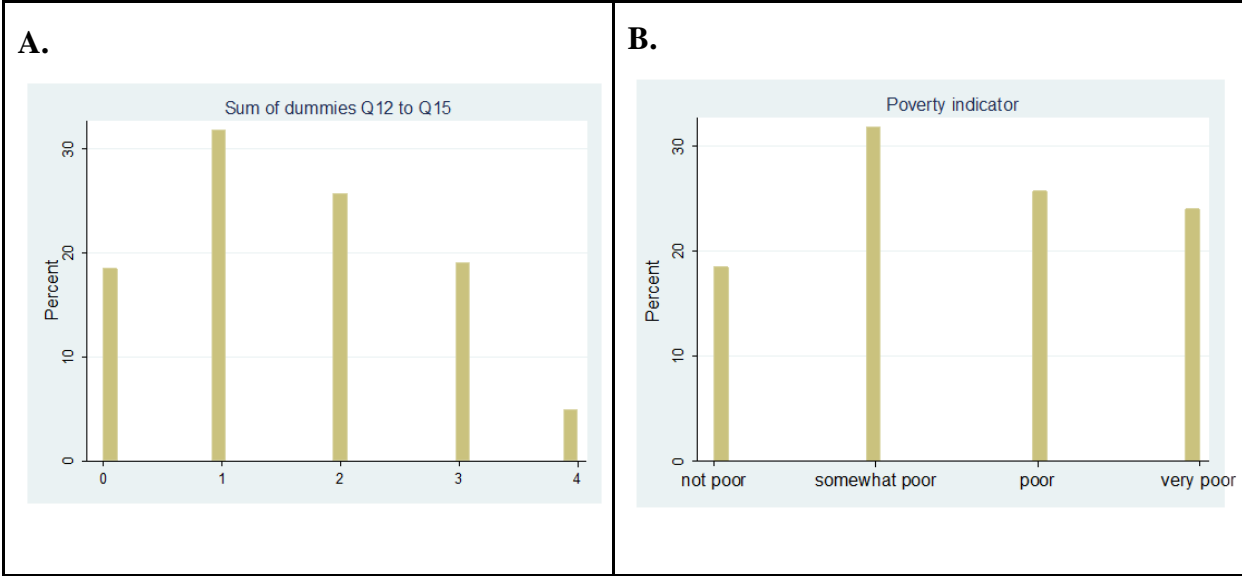
The same method is applied with regards to the formation of the background variables business plans, perception of pregnancy and proactive personality presented in table 5. First, thematically similar questions in the baseline survey are identified as summarized under each variable in table 5. Second, the individual questions are transformed into dummy variables to distinguish between girls with an above median answer (dummy=1) and those below median (dummy=0). With regards to business plans, this implies that the dummies for Q9 to Q11 turn one for girls indicating to have above median intentions to start a business in the near future. The dummies for Q16 to Q18 turn one to reflect an above median level of unhappiness about getting pregnant by next year of the girl, her parents and potential boyfriend. For Q19 to Q21, the respective dummies equal one if the participant depicted an above median level of trust in risk taking, her own ability to change her life and disbelief in destiny. By summing up the dummies of the individual questions underlying each control variable, an overview of the distribution between the different groups is achieved similar as the one shown in figure 3A. Again, the final step in the construction of the control variables is to redefine the groups found by summing up the dummies. The decision on how many groups to set up for each control variable is taken with respect to the distribution of participants across the groups obtained in

38

step three. The final outcome for business plans distinguishes between three groups of girls, those with no intentions to start a business in the near future, a group with some intentions and a group indicating to have strong intentions to do so. For the variable measuring the perception of pregnancy, the final background variable entails also three groups ranking from happy over unsure to unhappy about getting pregnant by next year. And finally, the variable proactive personality splits the survey participants into three different groups of personalities, ranking from least to most proactive.

Table 5: Summary statistics – Background variables

BACKGROUND VARIABLES	Med	Min	Max
Business Knowledge (0-3)	1	0	3
Health Knowledge (0-4)	2	0	4
Age (14-28)	17	14	28
Math knowledge (0-3)	1	0	3
Business plans (0 = no intention, 1= some intention, 2= strong intention)	1	0	2
Q9: Have you made plans to start a business?	0	0	1
Q10: If you are not selected for A-level, were does "starting a business" rank as an alternative plan for your future after Form IV? (1= highest priority)	3	1	6
Q11: If you had 1 million TZS, were does "starting a business" rank as a possible investment for your money? (1= highest priority)	2	1	4
Poverty (0=not poor, 1=somewhat poor, 2=poor, 3=very poor)	1	0	3
Q12: Is the roof of your house made of grass or mud?	0	0	1
Q13: What is the main source of electricity at your house?	2	1	4
Q14: How many times per week does your family eat meat in a normal week?	2	0	7
Q15: When did you last receive a new school uniform?	2	1	4
Perception of pregnancy (1= happy, 2= unsure, 3= unhappy)	2	1	3
Q16: If you became pregnant next year, would you be happy?	1	1	3
Q17: If you became pregnant next year, would your parents be happy?	1	1	3
Q18: If you became pregnant next year would your boyfriend be happy?	2	1	3
Proactive personality (1= not proactive, 2= somewhat proactive, 3= proactive)	2	1	3
Q19: I am in control of what happens in my life	3	1	3
Q20: I believe my future is determined by luck no matter how hard I work	3	1	3
Q21: A person can get rich by taking risks	3	1	3

Note: Answer alternatives for Q13:1) Electricity; 2) Kerosene lamp; 3) Candles; 4) Solar energy; 5) Other; Q14:Answer in number of days per week with 0=never and 7=every day; Q15:1) Less than 6 months ago; 2) Btw. 6 months and 1 year; 3) Btw. 1 and 2 years; 4) Over 2 years ago; Q16 to Q18: 1) No; 2) unsure, 3) Yes; Q19 to Q21: 1) I do not agree; 2) I neither agree nor disagree; 3) I agree

6 Analysis and findings

The following section describes the data analysis and findings of the research conducted in order to provide an appropriate answer to the guiding research question:

What is the link between the fertility aspirations of young girls in Tanzania and their level of health knowledge and business knowledge?

The analysis follows a stepwise approach by first looking individually and mutually at the correlation between health- and business knowledge and family plans and sexual activity, before including the six control variables described in section 5.2 to investigate the degree to which including additional variables mitigates the statistic relevance of the two main independent variables of interest. However, before providing an answer to the overall research question, the knowledge types underlying the treatments of the Girl Empowerment Project are analyzed in more depth.

6.1 Health and business knowledge

In order to do so, this first paragraph provides an explanation of how the knowledge variables are constructed and investigates upon the correlation between general intellectual ability and health and business knowledge. In the next step, a regression analysis is run with health and business knowledge as the dependent variables and the six control variables as independent variables in order to find out to what degree the different control variables determine the level of business and health knowledge depicted amongst the participants.

6.1.1 Health knowledge

The questionnaire entails four questions measuring the girls' current knowledge on sexual health related topics. The health knowledge variable is designed in a way that combines the answers provided to the four following multiple-choice questions:

1) Which of the following is a sexually transmitted disease? *A) Malaria; B) Meningitis; C) Gonorrhoea; D) Measles*

2) The lack of which of the following minerals is a key cause of anemia for pregnant women? *A) Iron; B) Magnesium; C) Salt; D) Calcium*

3) Which is not a common cause of urinary tract infections? *A) Sexual intercourse; B) Long delay before urinating; C) Irregular menstruation; D) Pregnancy*

4) Can a girl get pregnant the first time she has sex? *A) Yes; B) No*

Consequentially, the variable health knowledge can take values from zero to four as shown in figure 4 below, reflecting how many out of the four questions are answered correctly by the participant. An overview of how many girls fall into each correct answer category is provided in figure 4. It is noticeable that 43 percent of the girls managed to answer two questions correctly and almost 32 percent got the right answer to three out of four questions right. However, as the difficulty of the questions asked was easy to medium, this outcome does not necessarily imply that the girls in the sample possess a high level of health knowledge.

Figure 4: Distribution of levels of health knowledge
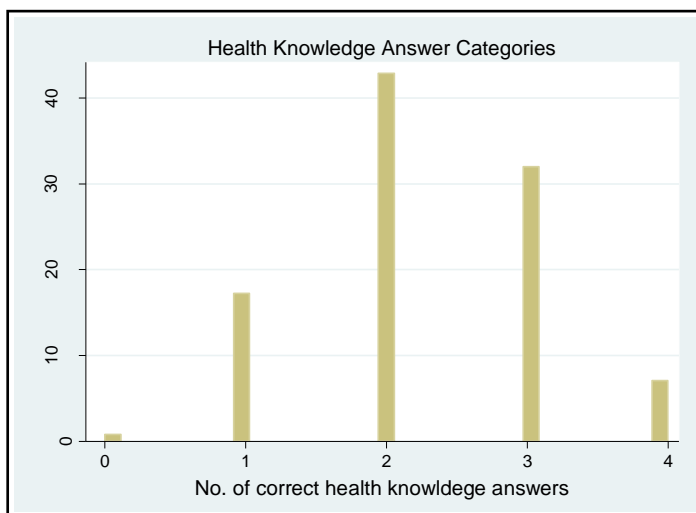
6.1.2   Business knowledge

Business knowledge is measured by the means of three relatively easy questions on business related topics such as profit, inventory and customer service as shown below.

1) Which of the following is an important part of customer service? *A) To never recommend the most expensive products to customers; B) To always praise the goods you sell; C) To be*

reliable in relations with the customer; D) To always recommend cheap products to customers

2) What is profit? *A) Profit is sales of the most important products; B) Profit is sales minus cost of goods and operating expenses; C) Profit is sales minus cost of goods and what you take home from the business; D) Profit is sales plus cost of goods and operating expenses*

3) Why is it important for the business to keep stock? *A) To have goods available for family consumption; B) To have goods available for the customers; C) To have goods available for the suppliers; D) To have goods available for a family emergency*

Following the same approach as for health knowledge, business knowledge is allowed to take any value between zero and three, depending on the number of correct answers provided to the individual business questions. As shown in figure 5, the overall level of business knowledge is relatively poor as almost 60 percent of the girls in the sample answered only zero or one of the three questions correctly.

Figure 5: Distribution of levels of business knowledge
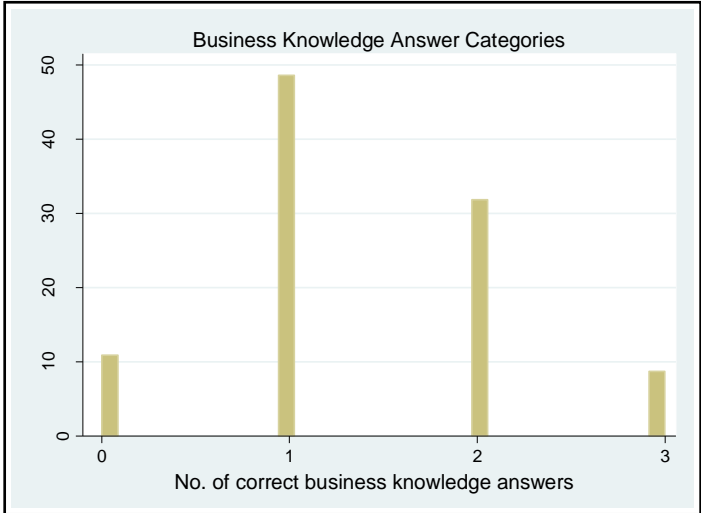
6.1.3   Determinants of health and business knowledge

Before running the regression, the issue of multicollinearity should be addressed, as it is possible that the different forms of knowledge (business, health and math) are strongly correlated. However, as depicted in table 6, the correlation between these types of knowledge

43

is in fact very low. This implies in turn that health and business knowledge variables measure different kinds of knowledge that are not fully captured by general intellectual abilities as measured by math knowledge.

Table 6: Correlation between types of knowledge

	Health knowledge	Business knowledge	Math knowledge
Health knowledge	1.0	---	---
Business knowledge	0.0807	1.0	---
Math knowledge	0.0910	0.1536	1.0

Even though the correlation matrix indicates that the three knowledge types of interest do not depict a high level of correlation, there might be other factors that are to a certain extent decisive for the level of health and business knowledge a girl manages to acquire. Therefore, it is of interest to find out to what degree the other control variables identified in section 5.2 determine the individual level of business and health knowledge depicted in order to identify their explanatory power with regards to the dependent variables at hand.

Table 7: Determinants of health and business knowledge

	Health Knowledge	Business Knowledge
Business knowledge	0.047*	---
	(0.0185)	
Health knowledge	---	0.039*
		(0.0155)
Age	-0.042**	-0.03*
	(0.0149)	(0.0136)
Math knowledge	0.072***	0.133***
	(0.0195)	(0.0178)
Poverty	-0.01	-0.059***
	(0.0139)	(0.0127)
Business plans	0.008	0.038*
	(0.0193)	(0.0177)
Proactive personality	0.117***	0.128***
	(0.0198)	(0.0181)
Pregnancy perception	0.109***	0.053**
	(0.021)	(0.0192)
Constant	2.434***	1.419***
	(0.273)	(0.251)
Number of observations	3481	3481

Standard errors in parentheses * $p<0.05$, ** $p<0.01$, *** $p<0.001$

The regression outcome presented in table 7 shows that the level of health knowledge increases for girls who prove to have higher levels of business knowledge and the other way around, at a five percent significance level. Those results indicate that the two variables are not completely independent from one another despite the low level of collinearity shown in table 6. The same holds true for math knowledge that shows a positive and significant coefficient. Looking at the negative correlation between age and both types of knowledge, the results suggest that older girls generally depict a lower level of both, business and health knowledge. While this outcome might sound counterintuitive at first, it becomes more logic when looking closer at the special characteristics of more mature girls included in the sample. As all girls included in the sample are currently enrolled in Form IV, a higher age can't be associated with the exposure to a higher level of education. In the contrary, the fact that girls of more mature age are still enrolled in Form IV might be a result of lower exposure to education as they apparently didn't manage to pass the final exam at a previous state in life.

45

Following that line of argumentation, it seems less surprising that older girls also prove to have lower levels of business and health knowledge as reflected by the negative coefficient of the age variable. Poverty and business plans turn out to be insignificant with regards to health knowledge. Business knowledge on the other hand is negatively associated with poverty. This could be explained by the fact that girls with poorer financial backgrounds are less likely to be exposed to business owners in their families and thereby have less chances of obtaining business knowledge outside of school. Business plans on the other hand are positively associated with the current level of business knowledge which makes sense in the way that girls who have already made plans to start a business after school are most likely to have been exposed to some relevant experience in that area through, for example, helping out relatives or friends in running a small shop. Turning to the significance of a proactive personality and a negative perception about pregnancy in the near future, the analysis reveals that both variables are significant and positively associated with the current levels of business and health knowledge depicted. There are a couple of possible explanations for this observation, one of them is that girls with a more proactive personality could also be more open minded and interested in learning and discovering new things. By consequence they might also be more eager to pursue a different career after school than to start a family right away. Thus, they are curious about business knowledge in order to acquire new skills allowing them to pursue an alternative career and more knowledgeable about sexual health as they have a strong motivation not to get pregnant at an early state in life. The same logic applies to the interpretation of the identified results for the perception about pregnancy. Girls who feel most negative about becoming pregnant in one year's time have a high motivation to learn about sexual health to protect them from unwanted pregnancy.

After having established a better understanding of what determines health and business knowledge, the analysis turns towards their relation with the dependent variables of interest, Family Plan and Sexual Activity. The following two sections provide an overview of the regression outcomes and a discussion of their main implications.

6.2 Family plan

In the following, the method of standardized coefficients explained in section 4 is applied in order to understand the extent to which the different levels of health and business knowledge are related to the girls' perceptions on family plans and to what degree including the control

variables impacts that relation. Two regression analyses are included in this section that hold the same set of independent and control variables but differ in the nature of the dependent variable included. The first regression employs the family plan as a binary variable, splitting the participants into two different groups of empowered versus non-empowered girls represented in figure 6A below. The second regression includes the dependent variable as a categorical variable distinguishing more narrowly between four different levels of empowerment with zero representing the least and three the most empowered group of girls as indicated in figure 6B. As addressed in section 5.1, a lower level of empowerment is associated with a higher risk of early pregnancy, whereas a more empowered attitude reflects the girls desire to enter marital life and motherhood at a comparatively late state in life. For the Family Plan Dummy the two groups of comparison are not exactly of the same size, with the empowered group representing only about 37 percent of the sample. In the case of the Family Plan Index, the groups are more equally distributed with the exception of the group representing the most empowered girls which is only about a third of the size of the other groups. In the subsequent analysis, it is interesting to find out if the differences between the two groups of empowered versus non-empowered girls turn out to be more or less pronounced when breaking the groups down into more narrow levels of empowerment.

Figure 6: Distribution of the family plan variables

47
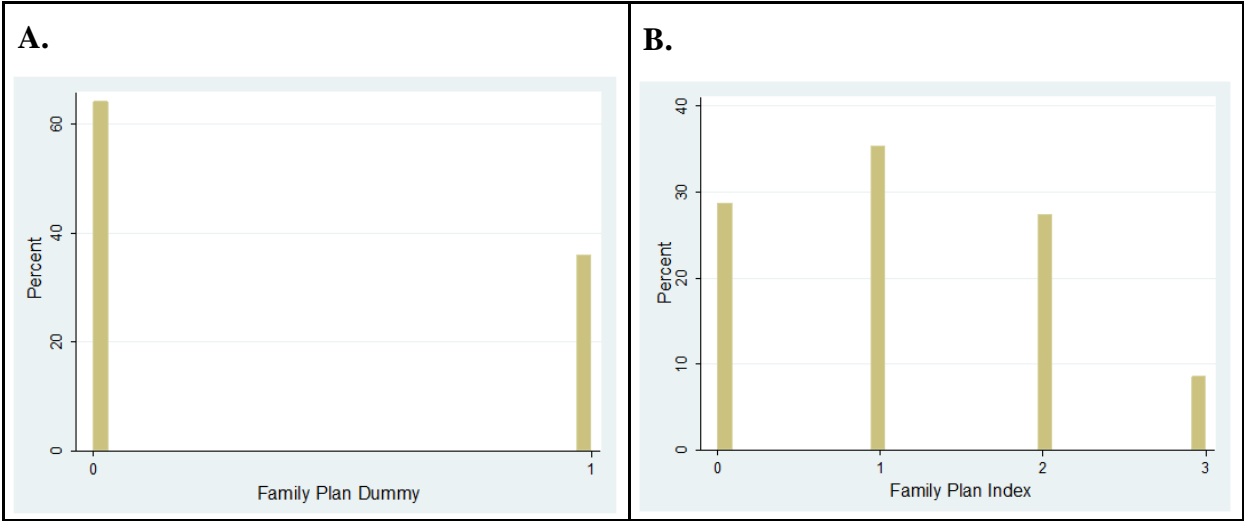
6.2.1 Relation between family plan and health and business knowledge

To compare the significance of the independent variables, four different models, each including a different set and combination of independent variables is created as represented in table 8. Model 1 looks at business knowledge individually while Model 2 considers only health knowledge. Model 3 includes both types of knowledge simultaneously and in Model 4 the remaining control variables are taken into account.

Table 8: Determinants of an empowered Family Plan Dummy

	(1)	(2)	(3)	(4)
	Family Plan Dummy	Family Plan Dummy	Family Plan Dummy	Family Plan Dummy
Business knowledge	0.046*** (0.01)	---	0.044*** (0.01)	0.030** (0.01)
Health knowledge	---	0.023* (0.01)	0.020* (0.01)	0.008 (0.01)
Age	---	---	---	-0.024** (0.01)
Math knowledge	---	---	---	0.008 (0.01)
Poverty	---	---	---	-0.015 (0.01)
Business plans	---	---	---	0.007 (0.01)
Proactive personality	---	---	---	0.036** (0.01)
Pregnancy perception	---	---	---	0.063*** (0.01)
Constant	0.307*** (0.02)	0.296*** (0.02)	0.254*** (0.03)	0.533*** (0.16)
Number of observations	3482	3482	3482	3481

Standard errors in parentheses * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Interpreting the numbers provided in model 1 shows that one standard deviation (SD) increase in business knowledge, leads to a 4.6 percent SD increase in the Family Plan Dummy variable. The p-value indicates that the result is significant at a 0.1 percent level. This

48

outcome suggests a quite strong positive relation between higher levels of business knowledge and a more empowered view on family planning. Turning to the relevance of health knowledge provided in model 2, the results display the same tendency but are less pronounced. A one SD increase in health knowledge causes a 2.3 percent SD increase in the dependent variable Family Plan Dummy at a 5 percent significance level. Thus, model 2 supports the existence of a positive correlation between health knowledge and an empowered attitude towards family plans, even though this relationship is less pronounced than for business knowledge. Including both variables simultaneously into the regression as represented in model 3 lowers the effect of both. Nevertheless, the variables remain statistically significant and suggest that with increasing levels of health and business knowledge, the likelihood of a girl having an empowered view on family related issues such as marriage and childbearing increases.

Including the six control variables age, math knowledge, poverty, business plans, proactive personality and perception of pregnancy into model 4 further mitigates the power of both, health and business knowledge. However, while business knowledge remains significant at a 1 percent level, health knowledge turns statistically insignificant when including all control variables into the regression. In this scenario both, the age and the proactive personality variables turn out to be significant at a 1 percent level. Age is negatively associated with the Family Plan Dummy which implies that older girls are less likely to have an empowered view on family related questions as measured by the underlying indicator. One possible explanation for this observation goes back to what was discussed in section 6.1.3 on the determinants of the knowledge variables. The older girls in the sample that are still enrolled in Form IV are likely to consider the option of starting a family in the near future to a larger extent than their younger classmates. This is because older girls are most probably exposed to higher social pressure to start a family soon due to the fact that they are of more mature age or because they have difficulties passing the final exam.

Girls with a proactive personality on the other hand prove to have a more empowered attitude towards family plans. A possible explanation for this observation is that girls with a proactive character might be more faithful in their ability to become economically active after school, rendering the option of starting a family right away less attractive. As shown in table 5, the questions underlying the proactive personality indicator study the girls' perception of their own decision making power as well as her risk averseness. Girls falling into the proactive

49

category believe that their future is to a larger degree determined by their own decisions instead of destiny and that taking risks often pays off. An additional interesting observation provided by model 4 (table 8) is the very strong significance of the variable measuring the girls' negative perception about becoming pregnant in the near future. The model shows that one SD increase in the independent variable is associated with a 6.3 percent SD increase in the Family Plan Dummy variable. Again the interpretation of this result is quite intuitive as girls who are most unhappy about the idea of becoming pregnant in one year time are likely to be the ones who want to enter motherhood and marital life at a later point in their lives.

To sum it up, the results of the regression analysis represented in table 8 suggest that perceiving business activity as an alternative option for the after-school life lowers the attractiveness of starting a family at a relatively young age. Health knowledge on the other hand is certainly of relevance with regards to teaching girls practices that prevent pregnancies. However, the power of health knowledge in predicting the Family Plan Dummy is partially captured by the business knowledge, age, proactive personality and perception of pregnancy variables, rendering the pure impact of health knowledge less significant when all variables are considered simultaneously. This is supported by the findings depicted in table 7 about the determinants of health knowledge. All four of the control variables that turned out to be significance in model 4 (table 8) are also significant in determining a participant's level of health knowledge as indicated by the high levels of significance shown in table 7. This implies that age, a proactive personality and a certain perception of pregnancy are to a certain extent more determinative for an empowered attitude towards family plans than health knowledge as such. Thus, only with regards to its ability to empower girls to postpone marital life and motherhood, business knowledge turns out to be more relevant than health knowledge.

In a next step the obtained results and interpretation attempts are tested against the outcome of the regression analysis including the Family Plan Index as a dependent variable.

Table 9: Determinants of an empowered Family Plan Index

	(1) Family Plan Index	(2) Family Plan Index	(3) Family Plan Index	(4) Family Plan Index
Business knowledge	0.117*** (0.02)		0.113*** (0.02)	0.083*** (0.02)
Health knowledge		0.054** (0.02)	0.046* (0.02)	0.021 (0.02)
Age				-0.041** (0.02)
Math knowledge				0.025 (0.02)
Poverty				-0.043** (0.02)
Business plans				-0.010 (0.02)
Proactive personality				0.065** (0.02)
Pregnancy perception				0.144*** (0.02)
Constant	0.995*** (0.03)	1.034*** (0.04)	0.896*** (0.05)	1.335*** (0.30)
Number of observations	3482	3482	3482	3481

* p<0.05, ** p<0.01, ***p<0.001

As depicted in table 9, the outcomes of the regression analysis using a categorical dependent variable point into the same direction as the ones observed when using the Family Plan Dummy (table 8). This implies that the coefficients of the previously identified significant variables business knowledge, age, proactive personality and perception of pregnancy remain significant in the regression shown in table 9. However, there is one striking difference compared to the previous results that is worth discussing in more detail in the following paragraph.

Table 9 indicates that the previously insignificant poverty variable turns out to be significant at a 1 percent level when running the regression with the Family Plan Index (table 9). With regards to the generally more disadvantaged position of girls from poorer families in terms of

access to education and the previously identified possibly higher exposure to pressure from family members to marry early, the negative relation between the poverty indicator and the Family Plan Index is not surprising. As mentioned in section 3, poverty is often associated with early marriages in order to release families from the obligation to provide for the girls in times of financial distress. A different explanation for why poverty influences a girl's perception of early marriage and motherhood is related to the proven significance of poverty in determining a participant's level of business knowledge shown in table 7. As discussed in section 6.1.3, poverty is for several reasons negatively associated with the acquisition of business knowledge. Combining these findings with the just explained relationship between business knowledge and family plans, the fact that poverty is important in the context of shaping a girl's fertility aspirations does seem reasonable. These results of table 9 suggest that by differentiating more carefully between the different levels of empowerment, an additional factor turn out to be significant in predicting a girls' attitude towards family planning that are not visible when dividing the participants in only two large groups.
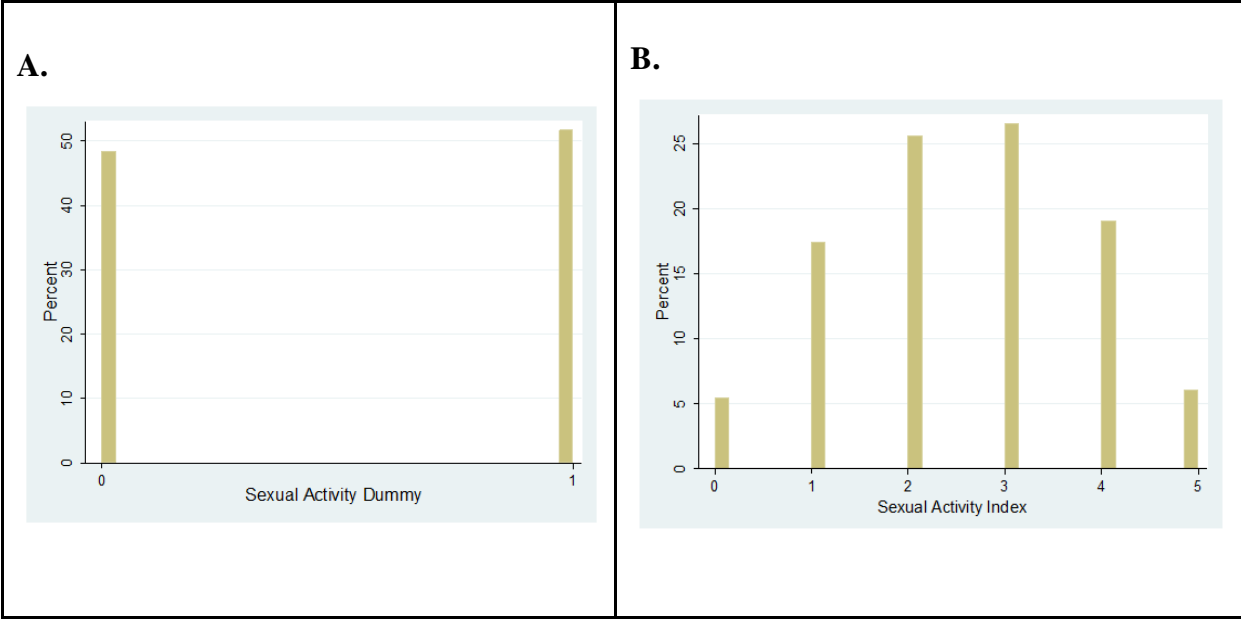
6.3 Sexual activity

Next to family planning, the relationship between the two types of knowledge and the girls' current level of sexual activity is of interest to the discussion about how the girls' fertility aspirations are linked to their depicted levels of health and business knowledge. On the one hand, one might suspect that health knowledge is associated with a more responsible or lower level of sexual activity and therewith lower risk of early pregnancy. A similar pattern is expected for the importance of business knowledge, even though the link between business knowledge and a certain sexual behavior is expected to work through more indirect channels. For example, to the degree that higher business knowledge is associated with higher current economic activity girls depicting this kind of knowledge might feel a lower need to engage in sexual intercourse in exchange for money or gifts.

Just as in the section on family plans, the following section describes a twofold regression analysis, starting with the binary dependent variable represented in figure 7A. It is noticeable that the sample splits almost equally into girls considered as less sexually active (dummy=0) and those who are more sexually active (dummy=1). With regards to the distribution of the Sexual Activity Index represented in figure 7B, the different groups are rather equally distributed with fewest girls falling into the extreme categories of being close to not sexually

active (group 0) and very sexually active (group 5). Almost 50 percent of the girls rank somewhere in the middle in group 2 and 3. As in the section on family planning, the results of both regressions are compared in order to figure out how the significance of the different variables changes when breaking the groups down into more narrow levels of sexual activity.

Figure 7: Distribution of the sexual activity variables

6.3.1 Relation between sexual activity and health and business knowledge

To test the relationship between sexual activity and the possession of health and business knowledge, the same methodology is applied as in the previous section. Two regression analyses are conducted, first employing the dependent variable as a dummy and second as a categorical index. In a four-step approach, the individual and joint effect of both types of knowledge are assessed and tested against the control variables introduced and discussed in section 5.

Table 10: Determinants of an empowered Sexual Behavior Dummy

	(1) Sexual Activity Dummy	(2) Sexual Activity Dummy	(3) Sexual Activity Dummy	(4) Sexual Activity Dummy
Business knowledge	-0.022* (0.01)		-0.021* (0.01)	-0.022* (0.01)
Health knowledge		-0.012* (0.01)	-0.011 (0.01)	-0.010 (0.01)
Age				0.015 (0.01)
Math knowledge				-0.029* (0.01)
Poverty				-0.014 (0.01)
Business plans				0.046*** (0.01)
Proactive personality				0.023* (0.01)
Pregnancy perception				-0.014 (0.01)
Constant	0.547*** (0.02)	0.544*** (0.02)	0.570*** (0.03)	0.305 (0.16)
Number of observations	3482	3482	3482	3481

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

As shown in model 1 (table 10), business knowledge is negatively associated with the level of sexual activity depicted by the girls in the sample. Considered individually, a one SD increase in business knowledge leads to a 2.2 percent SD decrease in the Sexual Activity Dummy which implies a lower level of overall involvement in sexual relations. The results are significant at a 5 percent level, rendering business knowledge an important factor in the discussion about what determines a girl's level of sexual activity. Looking into the underlying questions forming the Sexual Activity Dummy represented in table 11 below reveals that the importance of business knowledge is mainly driven by the negative relationship between business knowledge and having sexual intercourse and a lower usage of condoms. In other words, girls with higher business knowledge perceive it overall as less common for girls of their age to be sexually active or to use a condom. The first observation decreases a girl's

exposure to the risk of becoming pregnant whereas a lower use of condoms clearly increases the chances of early pregnancy. Using the condom question more as a tool to estimate the overall exposure of a girl to sexual intercourse and less as an indicator of safety would imply that girls who do not perceive the use of condoms as common are less involved in sexual relations overall. In this study the condom questions are believed to capture a little bit of both interpretations, leading to the result that the negative relationship between business knowledge and the Sexual Activity Dummy depicted in table 10 is mainly driven by a lower level of overall sexual activity of girls depicting higher levels of business knowledge.

Turning to the individual importance of health knowledge, model 2 reveals that health knowledge is also negatively associated with sexual activity at a 5 percent significance level. More concretely, when considered individually, a one SD increase in health knowledge leads to a 1.2 percent SD decrease in the Sexual Activity Dummy and therewith to a slightly lower level of sexual activity (model 2). This negative tendency is in line with the expectation raised in the introductory part of section 6.3 that girls with more sexual health knowledge might prove to also have a more empowered attitude towards sexual relationships. Looking at the relation between health knowledge and the underlying questions forming the Sexual Activity Dummy (Q1 to Q5) helps to gain a better understanding of which areas measuring sexual activity are most determined by health knowledge. Contrary to the raised expectations, it turns out that health knowledge is not associated with a more responsible use of condoms among the girls in our sample and neither with a lower willingness to exchange gifts for sex with older men. However, health knowledge is related to a lower likelihood of being in a relationship at a 6 percent significance level, lowering the girl's likelihood of having frequent sexual intercourse.

Table 11: Determinants of questions forming sexual behavior variables

	Q1:Having a boyfriend	Q2:Sexual Intercourse	Q3:Sex with older men	Q4:Use of condoms	Q5:Condom correct
Business knowledge	-0.016 (0.01)	-0.031** (0.01)	0.002 (0.01)	-0.030** (0.01)	-0.004 (0.01)
Health knowledge	-0.019 (0.01)	-0.005 (0.01)	0.017 (0.01)	-0.030** (0.01)	-0.003 (0.01)
Age	0.003 (0.01)	0.046*** (0.01)	-0.001 (0.01)	0.015 (0.01)	0.013 (0.01)
Math knowledge	-0.036** (0.01)	-0.006 (0.01)	0.010 (0.01)	-0.012 (0.01)	-0.030** (0.01)
Poverty	-0.034*** (0.01)	-0.005 (0.01)	-0.008 (0.01)	0.020 (0.01)	-0.027*** (0.01)
Business plans	0.033** (0.01)	0.047*** (0.01)	0.010 (0.01)	-0.006 (0.01)	0.033** (0.01)
Proactive personality	0.012 (0.01)	0.023 (0.01)	0.033** (0.01)	-0.002 (0.01)	0.029* (0.01)
Pregnancy perception	-0.019 (0.01)	0.005 (0.01)	-0.003 (0.01)	-0.046*** (0.01)	0.009 (0.01)
Constant	0.667*** (0.051)	0.380*** (0.051)	0.45*** (0.052)	0.526*** (0.049)	0.522*** (0.051)
No. of observations	3482	3482	3482	3482	3482

Including both knowledge types simultaneously into the regression as represented in model 3 (table 10), does almost not affect the size of the business knowledge coefficient which remains significant at a 5 percent level whereas health knowledge remains negatively associated with the dependent variable but now loses its statistical significance. Moving on to model 4 by including the control variables, the size and significance of business knowledge remains unaffected, whereas health knowledge is still of lower statistical relevance. Business plan and proactive personality depict positive coefficients, which are significant at a 0.1 and 5 percent level respectively (table 10). The outcome of the business plan variable is very surprising and counterintuitive in light of the negative coefficient observed for business knowledge and the previously identified link between business plans and business knowledge as represented in table 7. The positive coefficient of the variable measuring a girl's proactive personality on the other hand seems more intuitive. One possible way of interpreting those

results is that to the degree that a proactive personality is associated with a more outgoing, upfront and confident character, girls depicting that characteristic might be more sexually active. However, this interpretation goes beyond what is supported by the data set at hand and should therefore be acknowledged as a simple suggestion for the interpretation of the data results.

Math knowledge on the other hand turns out to be important in the context of sexual activity as its negative coefficient is significant at a 5 percent level (table 10). Similar to business and health knowledge, higher math competences appear to decrease the likelihood of girls being sexually active. Those results thus give reason to believe that there exists a certain tendency of girls with higher intellectual abilities captured by health, business and math knowledge to be less sexually active than girls with lower levels of knowledge. This is supported by the outcomes represented in table 11, suggesting that girls with both higher health and business knowledge do perceive sexual intercourse as less common and are less used to applying and buying condoms, even though the latter is of low statistical significance. Thus, the more empowered attitude towards sexual relations measured amongst girls with higher intellectual abilities is mainly caused by a lower exposure to sex overall and not by a more responsible attitude towards sexual relations. It is very likely however, that the apparent relation between higher levels of intellectual ability and lower engagement in sexual relations is also caused by some intangible factors. In that sense, intelligence in itself could be linked to some external factor which is not assessed by the questionnaire at hand and that reduces a girl's exposure to sexual intercourse as for example popularity of the girls, their looks, religion or something similar.

In the next step the just described results are compared to the regression outcome obtained by including a categorical dependent variable into the analysis (table 12). Comparing the results of table 10 and 12 shows if any of the variables under investigation become significant when dividing the participants into more narrow levels of empowerment.

Table 12: Determinants of an empowered Sexual Behavior Index

	(1) Sexual Activity Index	(2) Sexual Activity Index	(3) Sexual Activity Index	(4) Sexual Activity Index
Business knowledge	-0.078** (0.03)		-0.074** (0.03)	-0.081** (0.03)
Health knowledge		-0.050 (0.03)	-0.044 (0.03)	-0.043 (0.03)
Age				0.046* (0.02)
Math knowledge				-0.077** (0.03)
Poverty				-0.053* (0.02)
Business plans				0.119*** (0.03)
Proactive personality				0.093** (0.03)
Pregnancy perception				-0.055 (0.03)
Constant	2.653*** (0.04)	2.659*** (0.06)	2.749*** (0.07)	1.940*** (0.42)
Number of observations	3478	3478	3478	3477

* $p<0.05$, ** $p<0.01$, ***$p<0.001$

The results of table 12 show the same tendency as the ones depicted in table 10. The previously identified relevant variables business knowledge, math knowledge, business plans and proactive personality remain significant in table 12. However, an interesting observation is that in the second regression analysis poverty and age turn out to be significant at a 5 percent level. The coefficient of the poverty variable is negative so that a one SD increase in the level of poverty is associated with a 5.3 percent decrease in the Sexual Activity Index. Reasons for why girls with a poorer financial background should be less sexually active can be manifold. To find some further explanations for this result, the relationship between the poverty indicator and the individual questions underlying the Sexual Activity Index is considered as shown in table 11. The results suggest that being poor is significantly associated with a lower probability of having a boyfriend and answering the condom question correctly.

58

Both of which, not having a boyfriend and not knowing the price of a condom are in a broader sense an indication for a lower level of sexual activity and thus explain the negative coefficient of the poverty variable depicted in table 12. The interpretation of the positive and significant coefficient of the age variable on the other hand is more intuitive as one would expect mature girls to be more sexually active than their younger classmates.

To sum it up, the results obtained with regards to the analysis focusing on the level of sexual activity are less straight forward and more difficult to interpret than the results identified for family plans. However, one conclusion that stands out is that higher intellectual abilities and business knowledge in particular are associated with a lower engagement in sexual relations and therewith with a lower vulnerability to early pregnancy.

7 Discussion

In the following chapter, the results obtained from the preceding data analysis are discussed in the context of the issues introduced in the literature review and the institutional setting sections of this paper in order to provide an answer to the stated research question.

The data analysis has revealed some crucial links between health and business knowledge and the two chosen indicators measuring the girls' level of empowerment and associated vulnerability to early pregnancy. A summary of the findings is provided in table 13 below which serves as the basis for the subsequent discussion.

Table 13: Summary of regression outcomes

	Family Plan Dummy		Family Plan Index		Sexual Activity Dummy		Sexual Activity Index	
Business Knowledge	+	1%	+	0.1%	-	5%	-	1%
Health Knowledge	+	Ins.	+	Ins.	-	Ins.	-	10%

Note: Left-handed columns are an indication of whether the independent variable relates positively (+) or negatively (-) to the dependent variable. Right-handed columns indicate the respective levels of significance

7.1 Interpretation of the outcomes on business knowledge

With regards to the business knowledge variable, the regression outputs summarized in table 13 indicate that even at a pre-intervention state, higher levels of business skills are positively associated with a more empowered attitude of adolescent girls in Tanzania with regards to family plans and sexual activity. The results suggest that girls depicting higher levels of business knowledge have plans to enter marital life and motherhood at a comparatively later state in life. Furthermore, business knowledge is associated with a more empowered mindset with regards to sexual relations. The higher a girl's level of business understanding is, the lower her respective level of sexual activity turns out to be. Overall, the regression outcome gives reason to believe that business knowledge is strongly linked to a certain behavior and mindset that reduces the girls' vulnerability to early pregnancy. Thus, the following paragraph is dedicated to a brief discussion about possible dynamics underlying this relationship.

The first argument explaining the importance of business knowledge in the context of enabling girls to develop a more empowered attitude towards family life and sexual relations builds on the identified literature on economic empowerment. The findings discussed in

section 3 propose that the key to changing people's behavior is to provide them with the necessary knowledge and tools to pursue an alternative option. The fact that business knowledge turns out to be significantly associated with a more empowered attitude in all four of the regressions conducted in section 6 suggests that business knowledge might be such a necessary tool to mitigate external factors that would otherwise hinder girls in Tanzania to employ an empowered behavior. This suggests that higher business knowledge increases the girls' desire to become economically active and thereby triggers a more risk-averse attitude towards sexual relationships as early pregnancy would significantly limit a girl's chances for further education or a professional career for that matter. To conclude this argument, one explanation for the high importance of business knowledge is that girls depicting higher such knowledge at a present state consider economic activities as a valuable and desirable option for their future as opposed to immediately starting a family. Having that option in mind shows to significantly impact their current behavior and their plans for the near future in a way that is associated with a lower vulnerability to early pregnancy.

A second explanation for the high relevance of business knowledge in the context of empowering young girls in Tanzania builds on the arguments raised in the discussion of section 3 about the importance of family backgrounds in shaping the girls' economic and fertility aspirations. The observed regression outcomes propose that a large proportion of the girls depicting higher levels of business knowledge at a pre-intervention state come from wealthier families. The underlying chain of thought is that girls who depict a better understanding of business matters at a pre-intervention state probably come from families owning a business themselves as it seems likely that the girls picked up some of the knowledge while helping out in a family store. Families that own a business tend in turn to be better off in financial terms. This link between business knowledge and wealthier family background is also supported by the findings on the poverty indicator. Table 7 clearly depicts a significant negative relation between poverty and the possession of business knowledge.

Having identified a clear connection between a girl's higher understanding of business matters and her better financial situation, it is interesting to discuss to what degree a wealthier family background shapes her fertility aspirations. The literature presented in section 3 suggests that a wealthier family background is likely to encourage the development of a behavior associated with a lower vulnerability to early pregnancy. For one thing a better financial background might ease the pressure on girls to get married early in order to reduce

the number of dependent family members in need for support. What is more, girls from wealthier families are more likely to be encouraged to continue education and eventually start a career after school as their parents have themselves experienced the ultimate benefits of education. And finally, girls with self-employed parents and therewith a more solid financial background might even experience some sort of pressure to take over the family business after school which would explain their depicted tendency to plan marriage and pregnancy for a comparatively late state in life. Acknowledging those favorable conditions that might surround girls depicting higher levels of business knowledge at a pre-intervention state is important in order not to overestimate the empowerment effect of business knowledge itself.

However, the data clearly reflects a positive relationship between the depicted levels of business knowledge and an empowered mindset towards sexual activity and family plans. Thus, the outcome of this study provides optimism to believe that the planned business training intervention of the Girl Empowerment Project is likely to help the girls overcome external factors previously pushing them towards early motherhood, thereby reducing their vulnerability to early pregnancy.

7.2 Interpretation of the outcomes on health knowledge

With regards to the importance of health knowledge, the regression outcome suggests that higher levels of health knowledge are associated with a more empowered view on family planning as well as a lower level of sexual activity. However, the results are of much less statistical significance, suggesting that even though girls depict higher levels of knowledge, their willingness or ability to act upon it is limited. The following paragraph proposes two possible explanations underlying these results.

For one thing, it is possible that while higher levels of knowledge do indeed increase the girls' awareness about how to prevent unwanted pregnancies, external factors surrounding the livelihood of adolescent girls in Tanzania mitigate their ability to act accordingly. Such strong external influences could be one explanation for the rather counterintuitive finding that higher health knowledge is not associated with a more responsible sexual behavior amongst the girls in the sample. Social factors such as for example expectations from family and friends can crucially limit the girls' possibilities to resist behavior associated with a higher risk of becoming pregnant, regardless of their own understanding of the matter. In that sense, even

62

though the girls are aware of the risks attached to engaging with older men, they might still do so as a result of financial difficulties or pressure from their families. The same holds true for the use of condoms. Even in the case that girls know about the risks of having unprotected sexual intercourse, they still end up not using condoms in the majority of cases due to their overall low bargaining power in sexual relations. This interpretation of the findings with respect to the importance of health knowledge would suggest that the pure provision of health knowledge is not sufficient to trigger an actual change in behavior amongst the girls in the sample. A successful intervention method would thus need to equip the girls with the necessary abilities to overcome the external factors hindering their current ability to apply a more empowered attitude towards fertility decisions.

A second and somewhat different explanation for the observed regression outcome concerns the rather easy nature of the questions measuring health knowledge in the questionnaire. As shortly addressed in section 6.1.1, it is possible that the overall level of existing health knowledge among the girls in the survey is very low as all four questions asked were of rather easy nature. This could imply that the actual difference in the possession of health knowledge between the groups answering zero to four questions correctly is not that pronounced and that the knowledge among all participants can be considered as rather poor. This would in turn raise the expectation that providing additional health information could indeed have a great empowering impact on the girls' fertility aspirations. As suggested by the academic literature reviewed in section 2.1, to the degree that the high rates of teen pregnancy are actually caused by a lack of knowledge about sexual health, the information treatment is expected to be a very powerful tool to influence the girls' behavior.

Thus, the final impact of the health information campaign depends on whether the lack of information or the cultural ties surrounding the livelihood of young girls in Tanzania is the main driver of teen-pregnancies. The stronger the external factors, the lower the expected power of health knowledge to postpone the age of initial pregnancy.

8 Concluding remarks

The final part of this paper proposes some concluding remarks for the study at hand. Further, the implications of these findings with regards to the possible outcomes of the Girl Empowerment Project are addressed.

In light of the socio-economic challenges ahead and the demographic composition of Tanzania's society, improving the economic opportunities for adolescent girls needs to be among the highest priorities of current public policies. In that context, creating an environment that is conducive to generating women access to education plays a crucial role. As early pregnancies are one of the main reasons behind the persistently high school dropout rates among teenage girls in Tanzania, it is of incremental importance to improve the existing understanding of the underlying factors causing them. This study set out to explore the link between the types of knowledge underlying the treatments of the Girl Empowerment Project and the fertility aspirations of young girls. The results clearly indicate that, to a different degree of statistical significance, both types of knowledge are related to an attitude that leads to a lower vulnerability to early pregnancies.

The results of the regression analysis raise the expectation that the health information treatment is going to be successful in increasing the girls' awareness about sexual health issues. However, the outcomes are rather ambiguous about whether or not this higher level of awareness will translate into a substantial change in behavior that is associated with a lower vulnerability to early pregnancy. Especially with regards to the poorer girls in the sample who were identified as comparatively more exposed to the risk of early pregnancy, health knowledge alone seems to be insufficient to make the girls overcome the strong external factors pushing them towards early pregnancy. The opportunity treatment on the other hand is expected to significantly increase the girls' motivation to become economically active after school, consequentially fostering an attitude and mindset that is associated with a lower vulnerability to early pregnancy. In light of the higher importance of business knowledge identified in this paper, the business training intervention is expected to lead to a more pronounced change in behavior among the project participants than the individual health information treatment. Especially with regards to the poorest girls in the sample, increasing the girls' business skills is expected to significantly improve their personal development as well as trigger a lot of positive side effects benefiting the community and society overall.

9 Literature

Action Aid. (2013).Transforming Education for Girls in Tanzania: Endline research summary report. Retrieved 28.07.2013 from http://www.actionaid.org/sites/files/actionaid/3351_ed4girlstanzaniaendfinal.pdf.

Ashburn, K., Warner, A. (2010). Can Economic Empowerment Reduce Vulnerability of Girls and Young Women to HIV?. Retrieved 11.12.2013 from http://www.icrw.org/publications/can-economic-empowerment-reduce-vulnerability-girls-and-young-women-hiv.

Alderman, H., Hoddinott, J., & Kinsey, W. (2006). Long term consequences of early childhood malnutrition. Oxford Economic Papers, 58(3), 450–474.

Balile, D. (2013). Form 4 results in Tanzania trigger education debate. Retrieved 18.07.2013, from http://sabahionline.com/en_GB/articles/hoa/articles/features/2013/03/06/feature-02.

Berge, L. I. O., Bjorvatn, K., Juniwaty, K. S., & Tungodden, B. (2012). Business Training in Tanzania: From Research-driven Experiment to Local Implementation. Journal of African Economies, 21(5), 808-827.

Bjorvatn, K., Cappelen, A. W., Helgesson, L. S., Sørensen, E. Ø., & Tungodden, B. (2012). Edutainment for entrepreneurship; Evidence from a field experiment in Tanzania. Bergen, Norway.

Central Intelligence Agency. (2013). The World Factbook. Retrieved 29.07.2013, from https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html

Central Statistical Office. (2009). Zambia Demographic and Health Survey 2007. Maryland, USA.

Deaton, A. (2010). Instruments, Randomization, and Learning about Development. Journal of Economic Literature, 48(2), 424-455.

Debrah, Y. A. (2007). Promoting the informal sector as a source of gainful employment in developing countries: insights from Ghana. International Journal of Human Resource Management, 18(6), 1063-1084.

Dupas, P. (2011). Do Teenagers Respond to HIV Risk Information? Evidence from a Field Experiment in Kenya. American Economic Journal: Applied Economics, 3(1), pp. 1–34.

Fitzsimons, E., Malde, B., Mesnard, A., & Vera-Hernández, M. (2012). Household responses to information on child nutrition: experimental evidence from Malawi. IFS Working Papers.

Ghai, D. (1988). Youth enterprise and employment promotion. Paper presented at the Commonwealth Youth Affairs Council Meeting, Apig, West Samoa.

Government of Tanzania. (2012). Education Sector Performance Report 2011/2012. Tanzania: The United Republic of Tanzania. Retrieved 19.07.2013 from http://www.ed-dpg.or.tz/pdf/ESPR%20and%20AM/JESR%202011-12_Education%20Sector%20Performance%20Report.pdf.

Government of Tanzania. (2013). Education in Tanzania. Dar-Es-Salaam: The United Republic of Tanzania. Retrieved 29.07.2013, from http://www.tanzania.go.tz/educationf.html.

Harris, A. (2003). SME development and growth in foreign markets: The involvement of Indigenous Entrepreneur. Windhoek, Namibia.

International Labour Organization. (2012). ILO Report on Study of Correlation Between Economic Empowerment and HIV Vulnerability. Retrieved 20.07.2013 from http://www.tacaids.go.tz/index.php?option=com_docman&task=doc_download&gid=67&Itemid=142.

Jalan, J., & Somanathan, E. (2008). The Importance of Being Informed: Experimental Evidence on Demand for Environmental Quality. Journal of Development Economics, 87(1), 14-28.

Karlan, D., & Valdivia, M. (2011). Teaching Entrepreneurship: impact of business training on microfinance clients and institutions. The Review of Economics and Statistics, 2, 510.

Madajewicz, M., Pfaff, A., van Geen, A., Graziano, J., Hussein, I., Momotaj, H., Ahsan, H. (2007). Can information alone change behavior? Response to arsenic contamination of groundwater in Bangladesh. Journal of Development Economics, 84(2), 731-754.

Mbaziira, S. (2007). Advancing entrepreneurship education in Namibia: A practical approach. Retrieved 28.07.2013 from http://ir.polytechnic.edu.na/bitstream/10628/115/4/Mbaziira%20%26%20Oyedokun.%20Advancing%20entrepreneurship%20education.pdf.

Menard, S. (2011). Standards for Standardized Logistic Regression Coefficients. Social Forces, 89(4), 1409-1428.

Milne, M. J., Tregidga, H., & Walton, S. (2003). The triple bottom line: benchmarking New Zealand's early reporters, 2(5), 37-48.

Mulenga, L. C. (1997). Youth enterprise and entrepreneurship in Zambia. Draft Discussion Paper. IDRC, Canada.

Muthengi-Karei, E., & Erulkar, A. (2012). Increasing opportunities to delay marriage and promote schooling. Dar es Salaam, Tanzania.

National Bureau of Statistics. (2011). 2010 Tanzania Demographic and Health Survey: Key Findings. Calverton, Maryland, USA.

NCCR. (2012). Voices of Youth: Tanzanian teens turn their own lens on teen pregnancy. Bern, Switzerland.

Noymer, A. (2010). Standardized Coefficients. Retrieved 18.07.2013 from https://webfiles.uci.edu/noymer/web/teaching/standard_coeff.pdf.

Oppedahl Berge, L. I., Bjorvatn, K., & Tunggodden, B. (2011). Human and financial capital for microenterprise development: evidence from a field and lab experiment. Bergen, Norway.

Popper, K., (2005). The Logic of Scientific Discovery. 5th ed. New York, USA.

Ricketts, E., & Covington, D. (2012). Gender inequality and access to secondary education in Tanzania: An analysis of legislation, policy, and culture. Paper presented at the annual meeting of the 56th Annual Conference of the Comparative and International Education Society, Caribe Hilton, San Juan, Puerto Rico. Retrieved 12.08.2013 from http://citation.allacademic.com/meta/p553748_index.html.

Rugemalira, J. M. (2005). Theoretical and practical challeges in a Tanzanian English medium primary school, Africa&Asia, 5, 66-84. Göteborg, Sweden.

Snyder, L., B. (2007). Report: Health Communication Campaigns and Their Impact on Behavior. Journal of Nutrition Education and Behavior, 39(2), 32-40.

Stolberg, O. H., Norman, G., & Trop, I. (2004). Randomized Controlled Trials. American Journal of Roentgenology, 183(6), 1539-1544.

Tungodden, B. (2013). Project Report: Girls' Economic Empowerment - the Best Contraceptive? Bergen, Norway.

UNDP. (2013). Human Development Report 2013. New York, USA:.

UNICEF. (2003). Girls' Education in Tanzania. Dar es Salaam, Tanzania.

United Nations. (2013). The Millennium Development Goals Report 2013. New York, USA.

United Nations Tanzania. (2013). Education: Challenges and Opportunities. Retrieved 20.07.2013, from http://tz.one.un.org/index.php/what-we-do/education.

USAID. (2013). Tanzania Education Strategy for Improving the Quality of Education 2009-2013. Dar es Salaam, Tanzania.

White, S., & Kenyon, P. (2001). Enterprise-based youth employment policies, stagies and programmes. Geneva, Switzerland.

World Health Organization. (2012a). Early marriages, adolescent and young pregnancies. Retrieved 25.07.2013 from http://apps.who.int/gb/ebwha/pdf_files/WHA65/A65_13-en.pdf.

World Health Organization. (2012b). Preventing early pregnancy and poor reporductive outcomes among adolescents in developing countries. Retrieved 18.07.2013 from http://whqlibdoc.who.int/hq/2012/WHO_FWC_MCA_12_02.pdf.

Yin, R. K. (1994). Case Study Research: Design and methods, 2nd ed. Thousand Oaks, USA.

Zikmund, W. G. (2003). Business Research Methods 7th ed. Mason, USA.